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MICROLINE 895FP

OEL Maintenance Manual

Revision 1

Rev	Date	Date	Name
		2013-11-07	MICROLINE 895FP Maintenance Manual (ODA/OEL/AOS1)

Oki Data Corporation

Document Revision History

Rev. No.	Date	Corrected items			Person in charge
		No.	Page	Description of change	
1	2013-11-07			Issue	P3E21 T. Ohtaki

PREFACE

This manual is for people involved in maintenance and describes on-site maintenance methods for MICROLINE 895FP.
Among the configured parts, those that must be specified for ordering such as print circuit board are applied with a number.

E.g. ABC-3 Print circuit board

The number is applied to specify the type of configuration part and is not the version number.
Parts are not described in numbers other than those listed in the configuration parts table unless otherwise required.
Regarding the methods for handling and operating the device, please refer to the Users Manual.

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1. CONFIGRATION

1.1 Standard Configuration

(1) Cover Top assembly
(2) Cover Middle assembly
(3) Cover Side L
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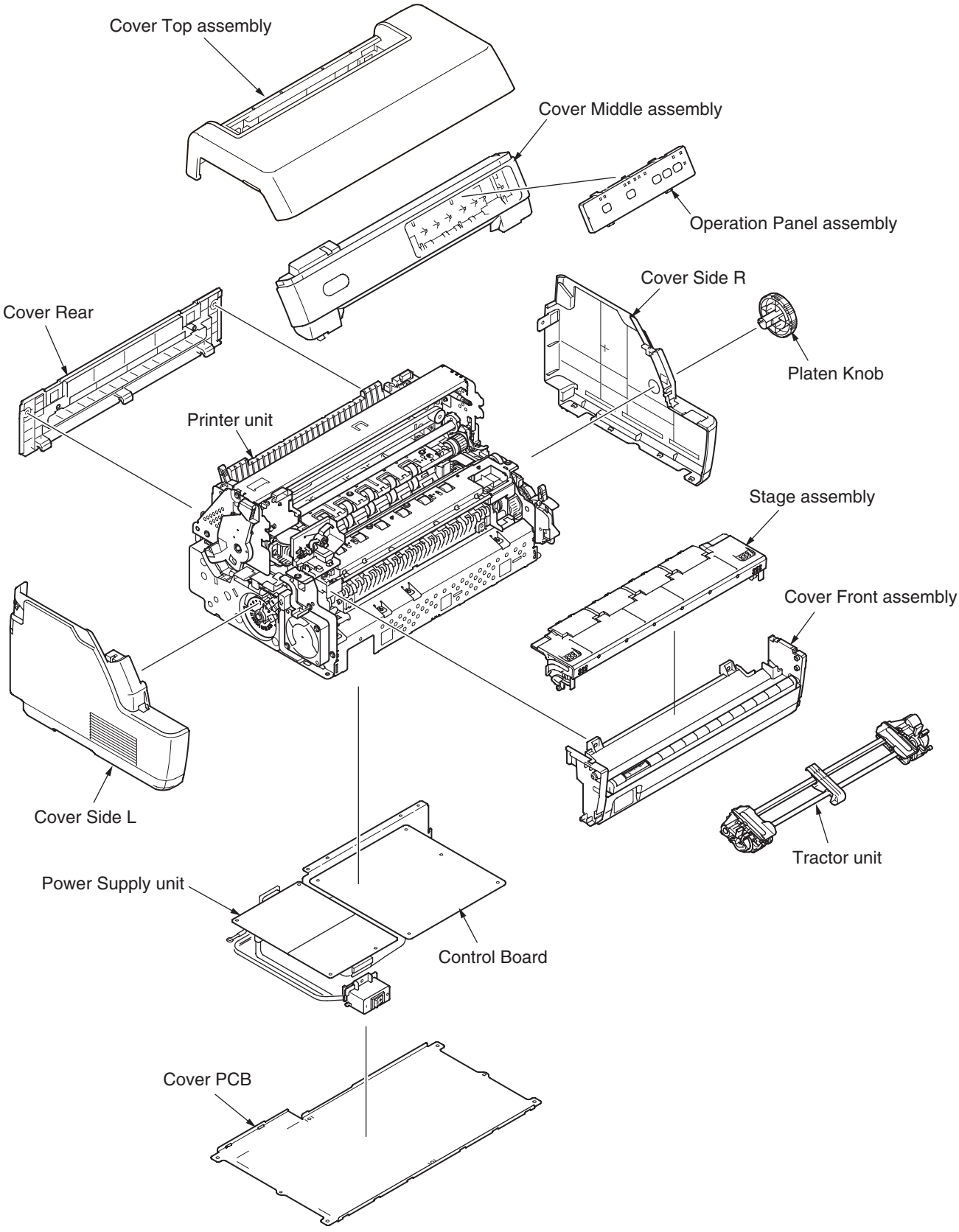
(5) Cover Front assembly
(6) Cover Rear
(7) Stage assembly
(8) Platen Knob
(9) Operation Panel assembly
(10) Printer unit
(11) Control Board
(12) Power Supply unit
(13) Cover PCB
(14) Tractor Unit



2. CLEANING

CAUTION:

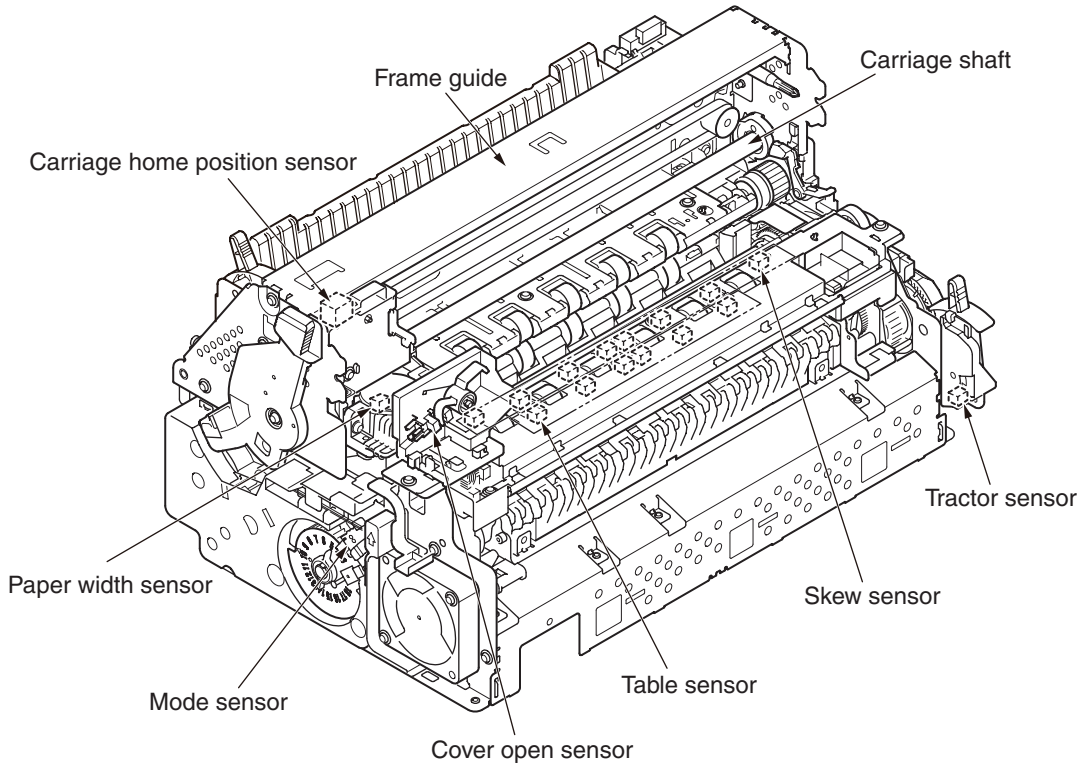
- Turn OFF the power source switch when cleaning.
- Be careful that chipped paper or dust does not go into the mechanism.
- After cleaning lubricated portions, be sure to lubricate again.

Clean the inner sections of the printer at a scheduled interval according to the following conditions.

Interval: After operating for six months or 300 hours.
Required Time: Approx. 10 minutes
Tools: Dry cloth (soft cloth such as a gauze), brush, cotton swabs, vacuum cleaner
Sections to Clean: See Table 2-1.

Table 2-1 Section to Clean

Section to Clean	Contents
Carriage shaft and its periphery	Eliminate chipped paper and wipe away dust,ribbon chips,etc.
Both sides of the frame guide upper section	
Paper path surface	
Table sensor Skew sensor Tractor sensor Mode sensor Paper width sensor Carriage home position sensor Cover open sensor	Wipe off dust attached to the sensor using a brush or cotton swag.



2.1 Cleaning the Sensors

2.1.1 Cleaning the Table sensor and Skew sensor

(1) Remove the Cover. (See 5.2.2)

(2) Remove the Guide sheet front upper. (See 5.2.8)

(3) Wipe the sensor with a cotton swab.

2.1.2 Cleaning the Mode sensor, Tractor sensor and Cover open sensor

(1) Remove the Cover. (See 5.2.2)

(2) Wipe the sensor with a cotton swab.

2.1.3 Cleaning the Paper width sensor

(1) Remove the Print head. (See 5.2.1)

(2) Wipe the sensor with a cotton swab.

2.1.4 Cleaning the Carriage home position sensor

(1) Remove the Carriage. (See 5.2.15)

(2) Wipe the sensor with a cotton swab.

2.2 Cleaning the Platen

The platen will be become dusty after using the continuous form paper.

3. LUBRICATING

Lubricate the required section according to the following items.

(1) Timing
This printer is a maintenance-free device, therefore, it does not require lubrication while in operation. However, it must be lubricated after disassembling/reassembling, cleaning lubricated sections, or replacing parts.

(2) Lubricant
- Alvania grease or equivalent: GEP

(3) Amount of lubricant
- Sufficient .....Ⓐ ..... Apply the amount of lubricant needed.
- Normal .....Ⓑ ..... Apply three or four drops of oil or approximately 0.2 mm thick grease.
- Small .....Ⓒ ..... 0.006 ± 0.002 g

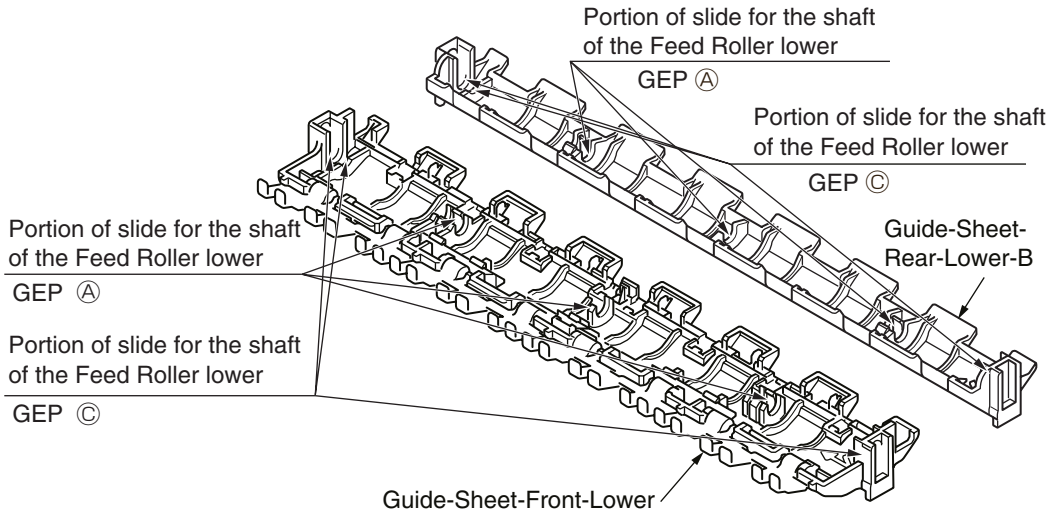
(4) Parts that must not be lubricated

Table 3-1 Parts that must not be lubricated

No.	Prohibited Parts	Reason	Remarks
1	Ink ribbon	To prevent smeared print	
2	Sensors	To prevent dust from attaching	
3	Platen (resin surface)	To prevent smeared paper	
4	Feed roller (resin surface)	To prevent smeared paper	
5	Pin tractor	To prevent rubber from deteriorating	
6	Carriage shaft	To secure carriage run load	
7	Head cable	To prevent faulty contact and cracking	
8	Print head	To prevent faulty operation of print head	
9	Mini pitch belt	To avoid rubber deterioration	
10	Terminal (e.g., connector)	To avoid contact failure	

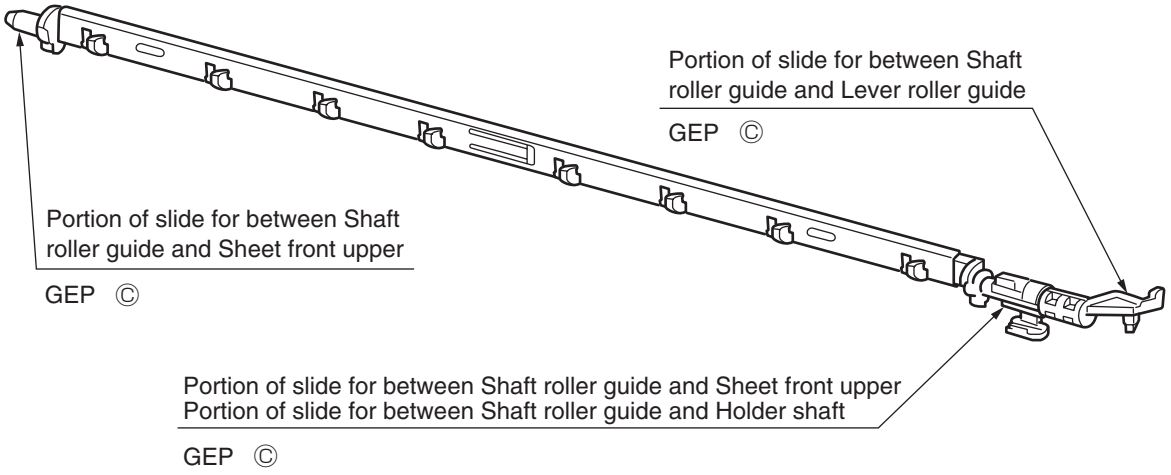
(5) Parts to lubricate
Lubricate the parts indicated in the following figure.

a) Guide sheet lower section

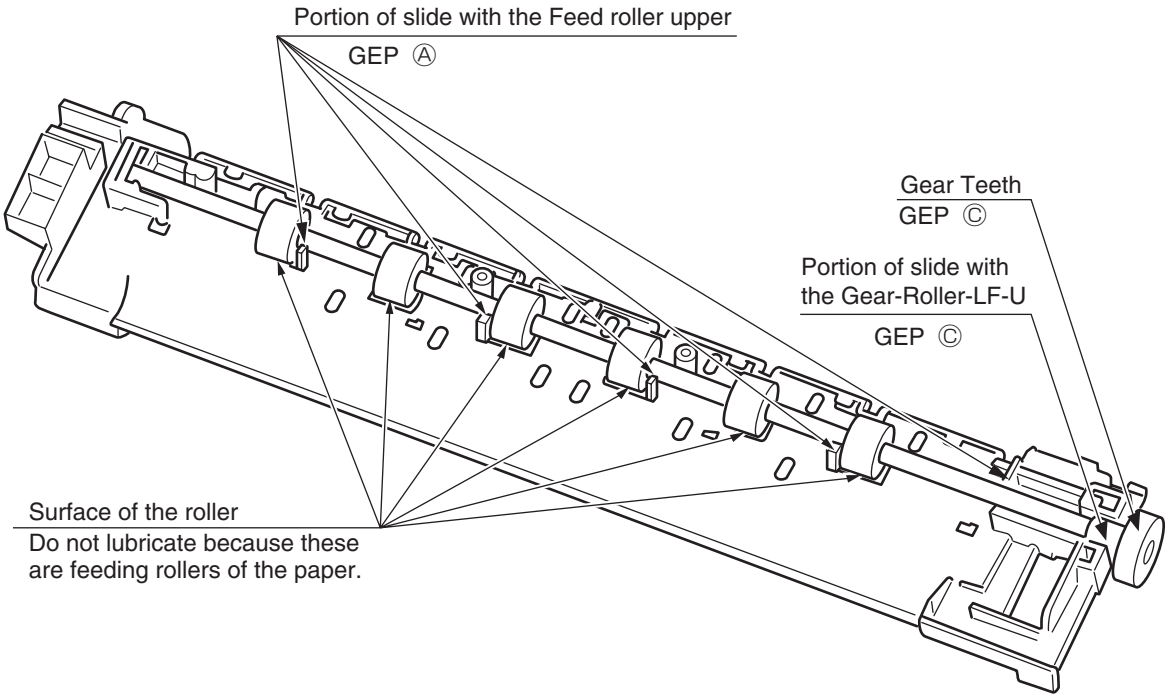


Note!: Do not adherent the GEP to the feed roller.

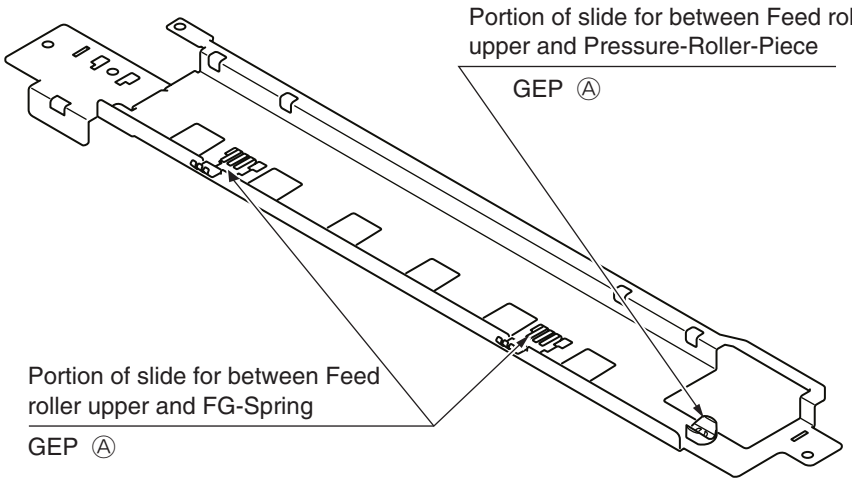
b) Roller guide assembly section
Note!: Do not adherent the GEP to the feed roller.

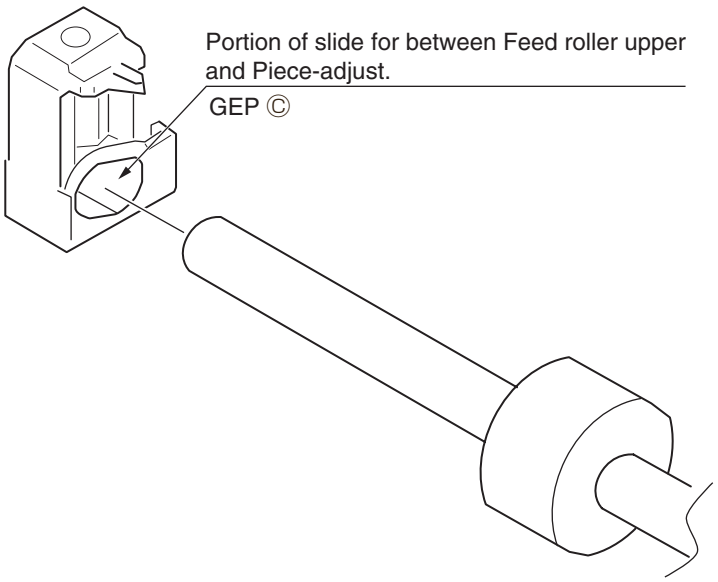

Portion of slide for between Shaft
roller guide and Lever roller guide
GEP Ⓒ
Portion of slide for between Shaft
roller guide and Sheet front upper
GEP Ⓒ
Portion of slide for between Shaft roller guide and Sheet front upper
Portion of slide for between Shaft roller guide and Holder shaft
GEP Ⓒ

c) Guide sheet upper front section

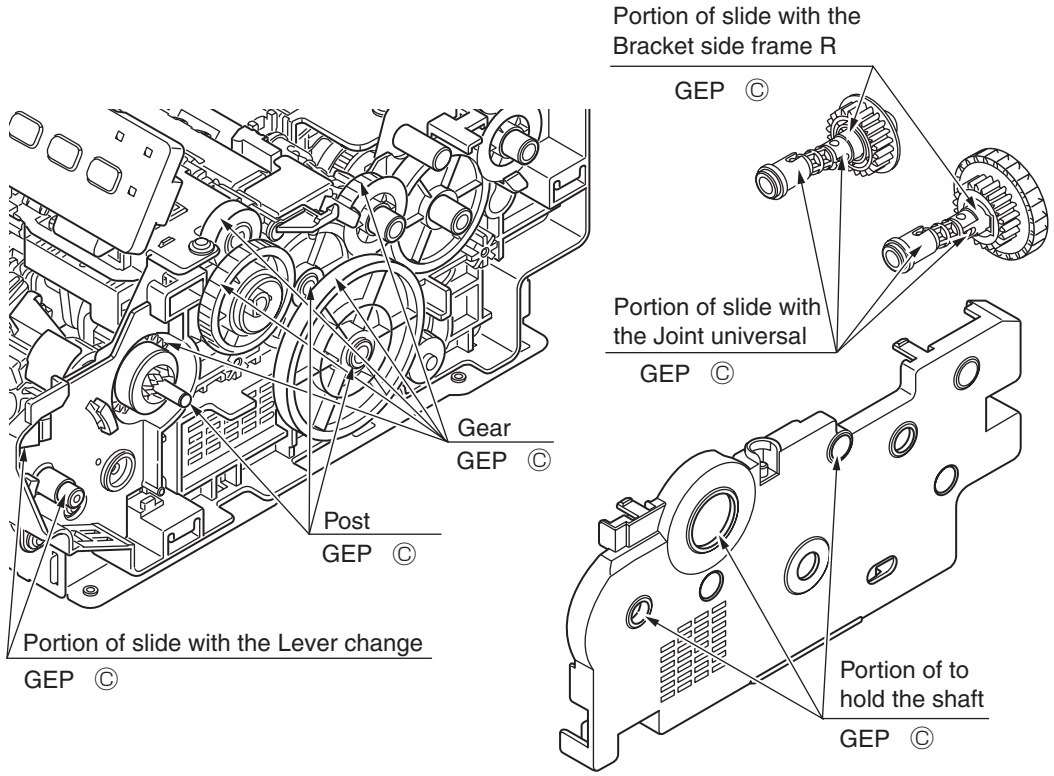


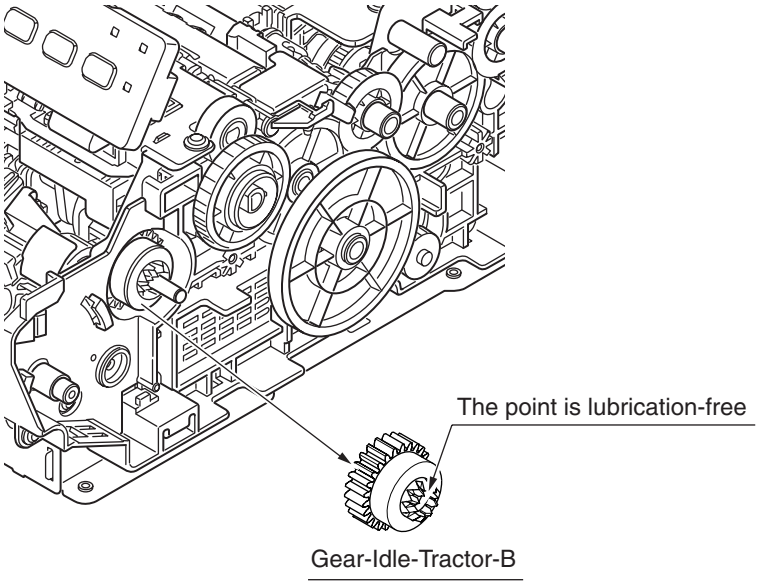
Note!: Do not adherent the GEP to the feed roller.

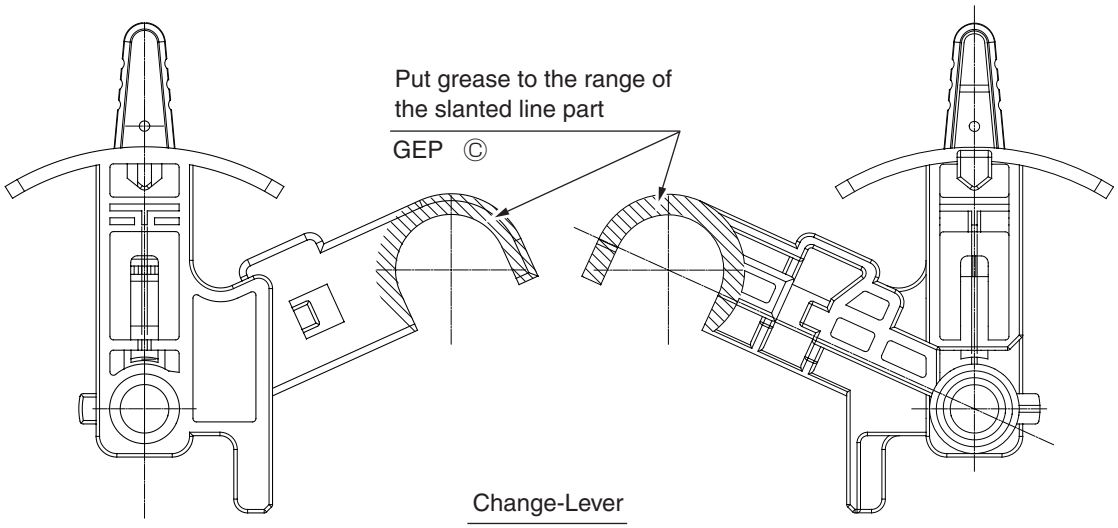

Portion of slide for between Feed roller
upper and Pressure-Roller-Piece
GEP Ⓐ
Portion of slide for between Feed
roller upper and FG-Spring
GEP Ⓐ



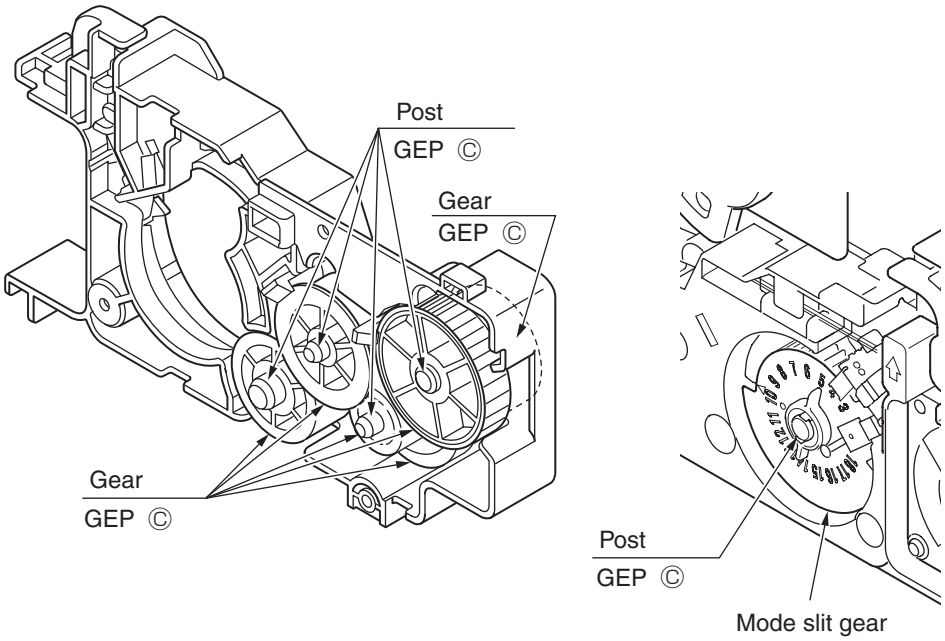
d) LF gear section

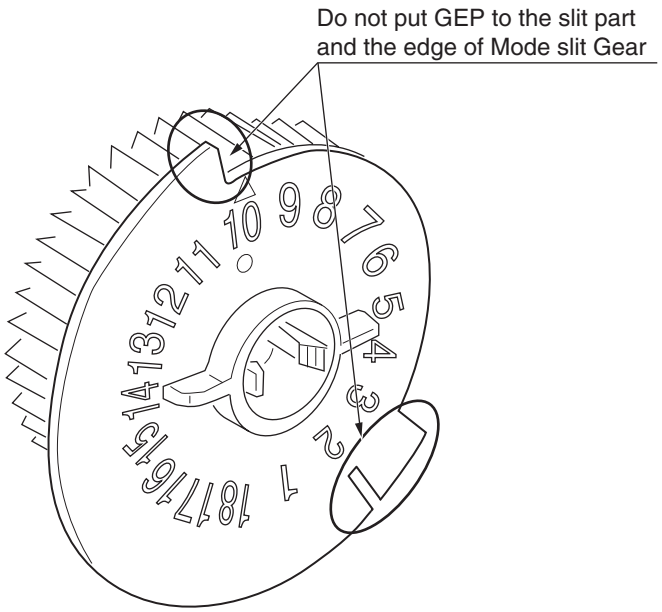




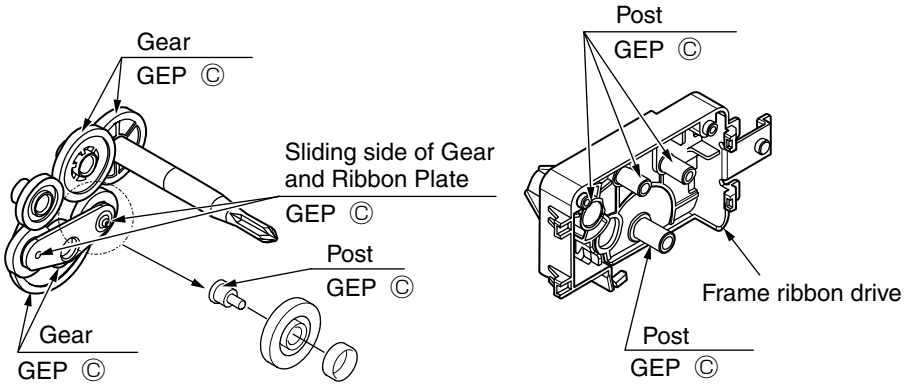


e) Mode gear section

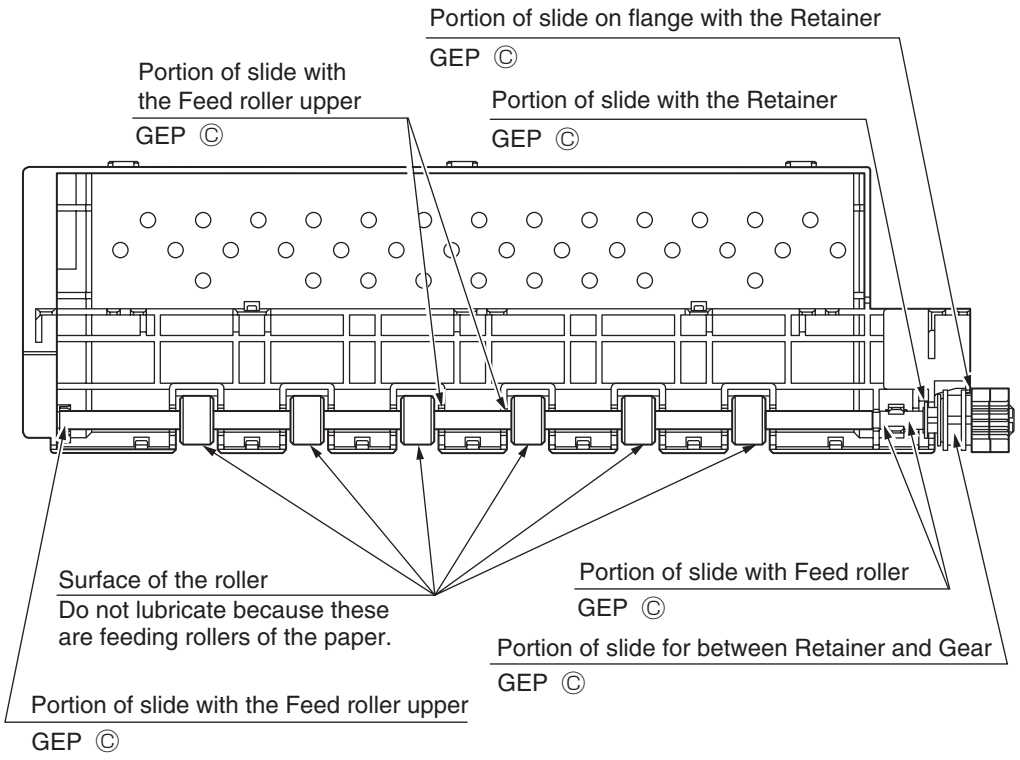




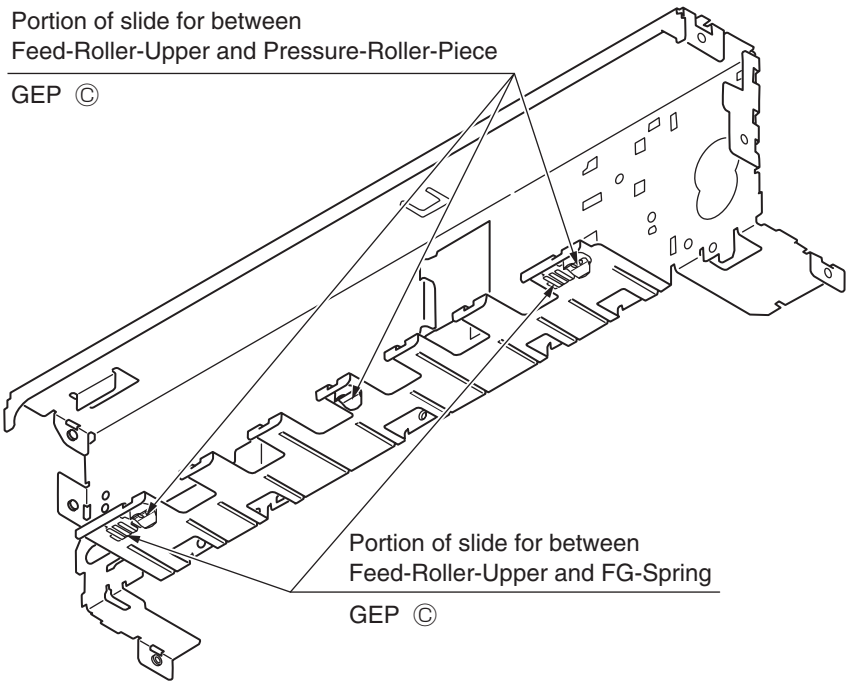
f) Ribbon feed assembly section



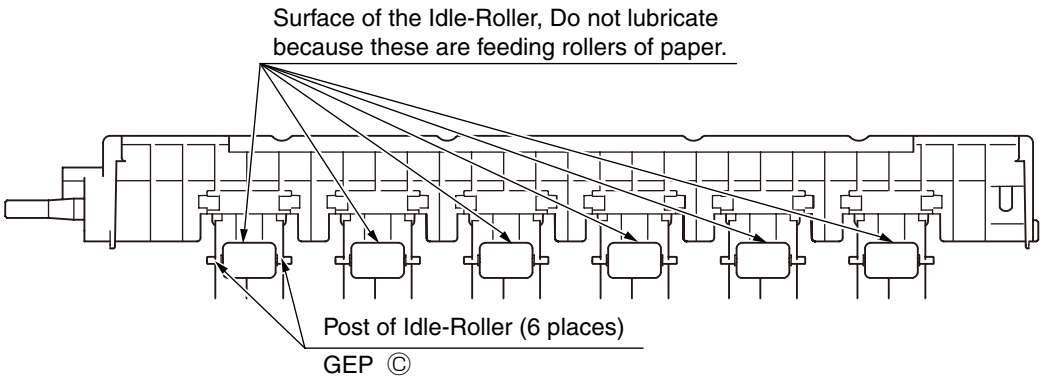
g) Guide sheet upper rear section


Portion of slide on flange with the Retainer
GEP Ⓒ
Portion of slide with
the Feed roller upper
GEP Ⓒ
Portion of slide with the Retainer
GEP Ⓒ
Surface of the roller
Do not lubricate because these
are feeding rollers of the paper.
Portion of slide with Feed roller
GEP Ⓒ
Portion of slide for between Retainer and Gear
GEP Ⓒ
Portion of slide with the Feed roller upper
GEP Ⓒ

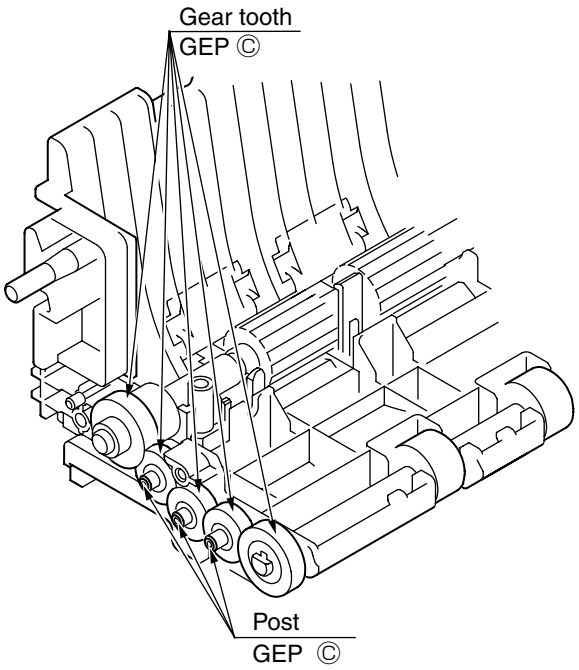
h) Space frame A section



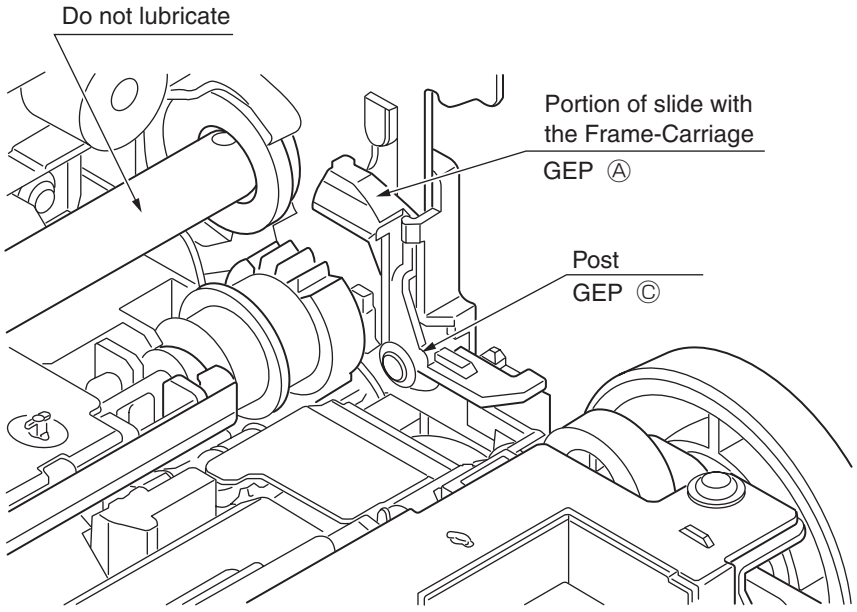
i) Idle Roller section



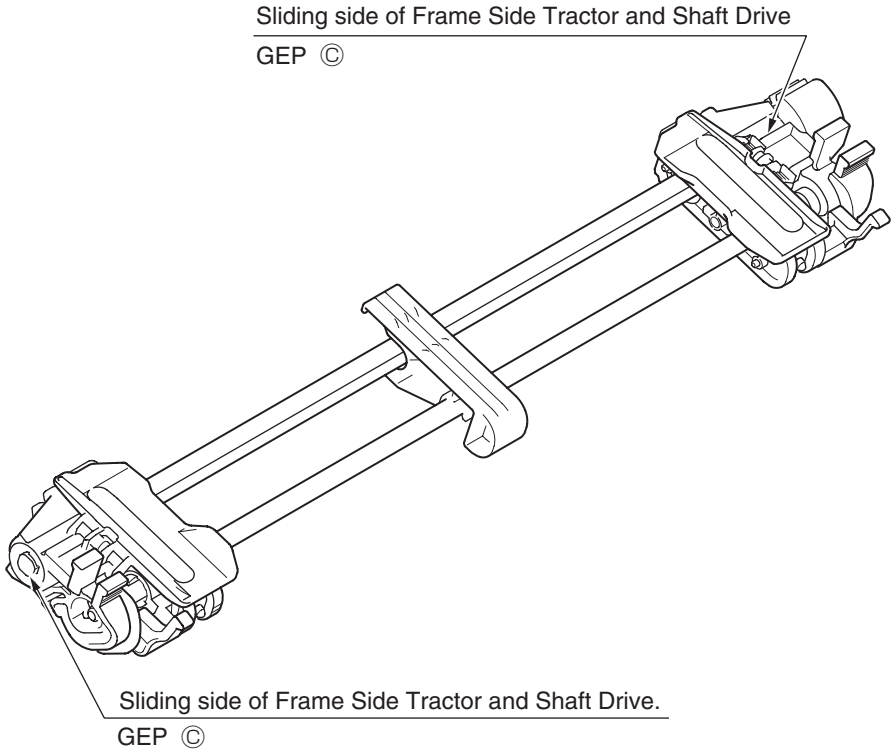
j) Stacker gear section



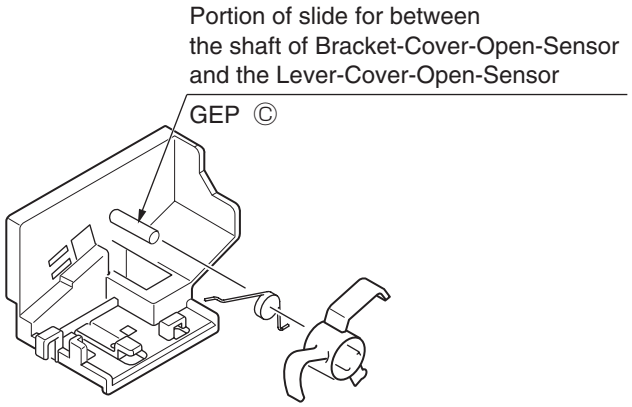
k) Lever roller guide section



I) Tractor section



M) Cover-Open-Sensor section



4. MAINTENANCE TOOLS

Tools required for replacing parts of the print board and unit on-site are listed in Table 4-1.

Table 4-1 Maintenance Tools

No.	Maintenance Tools	Quantity	Application	Remarks
1	No.1-100 Phillips screwdriver	1	2~2.6 mm screws	
2	No.2-200 Phillips screwdriver	1	3~5 mm screws	
3	5-200 screwdriver	1	3~5 mm screws	
4	No.3 pliers	1		
5	No.5 nippers	1		

5. REPLACING PARTS

5.1 Precautions Upon Replacing Parts

(1) Turn OFF the printer power switch before disassembling, and first pull the AC plug out from the outlet, then disconnect the AC cord and interface cable from the printer.

⚠Warning	Risk of Electric Shock	

There is a risk of electric shock during replacement of the low voltage power supply.

Use insulating gloves or avoid direct contact with any conducting part of the power supply, and caution should be exercised during replacement.

The capacitor may take one minute to complete discharge after the AC cord is unplugged. Also, there is a possibility that the capacitor doesn't discharge because of a breakage of the PCB, etc., so remember the possibility of electric shock to avoid electric shock.

(2) The print head is extremely hot after a print job, therefore, start the disassembling task five minutes after turning OFF the power.

Furthermore, leave at least 20 seconds after turning OFF the power before disassembling the circuit parts (control board, print head, etc.) in order to prevent electronic parts from being damaged.

(3) Remove paper and ribbon from the printer before disassembling.

(4) After replacing or inspecting parts, be sure to check that connecters are properly connected and that there are no abnormalities.

(5) Do not disassemble the printer when it is operating properly.

(6) Determine the range of disassembling the printer according to the objective and do not disassemble beyond that range.

(7) Use specified maintenance tools.

(8) Disassemble the parts in the specified order. Parts may damage if they are not disassembled in proper order.

(9) Small items such as screws and collars can be lost easily, therefore, set them in their original position temporarily.

(10) IC such as SOC, ROM, and RAM can easily be damaged by electrostatic, therefore, do not wear gloves that build up electrostatic when handling the print board.

(11) Do not place the print board directly on the floor or printer.

5.2 Removing and Reinstalling Parts

5.2.1 Print head

Note!

Do not touch the print head before it is cool down, because it is extremely hot after the print job and it causes burning.

(1) Power off and open the cover top.

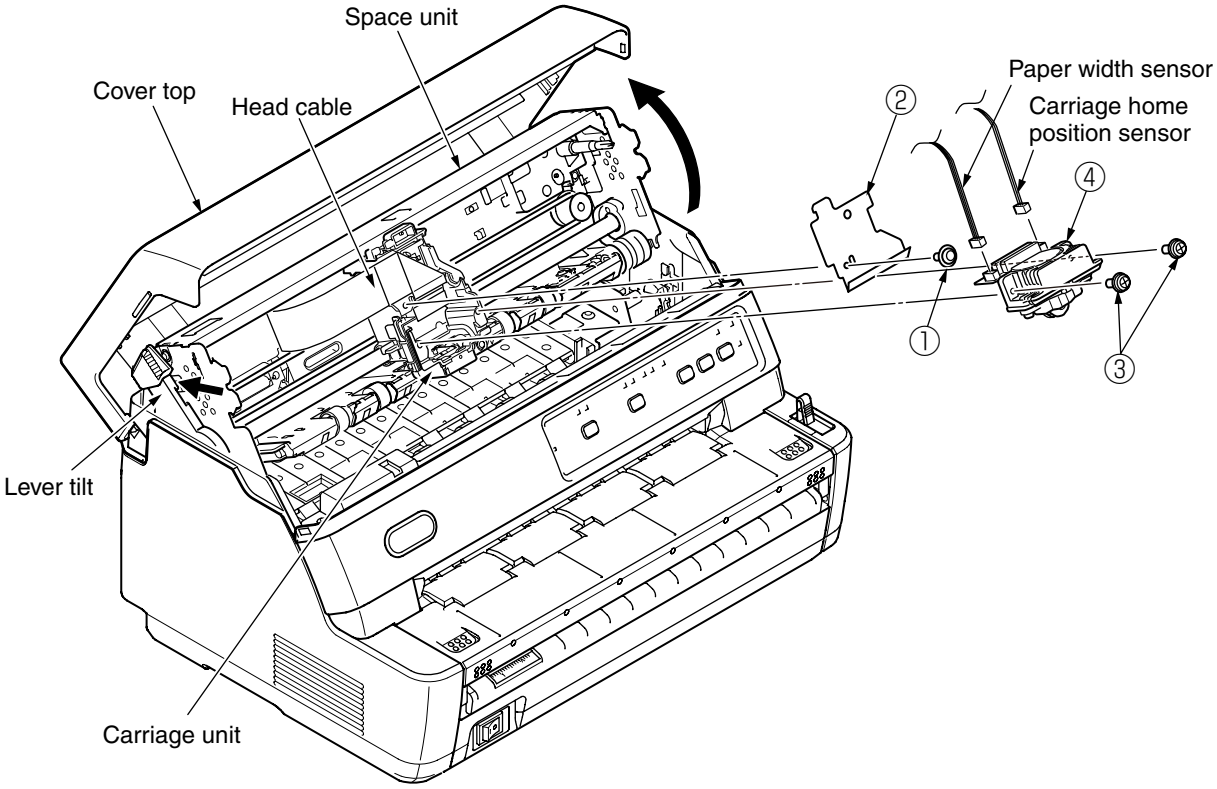
(2) Turn to the rearward the Lever tilt to open the Space unit.

(3) Remove a Screw ① to detach the Film cable guide ② .

(4) Remove two Screws ③ to detach the Print head ④ .

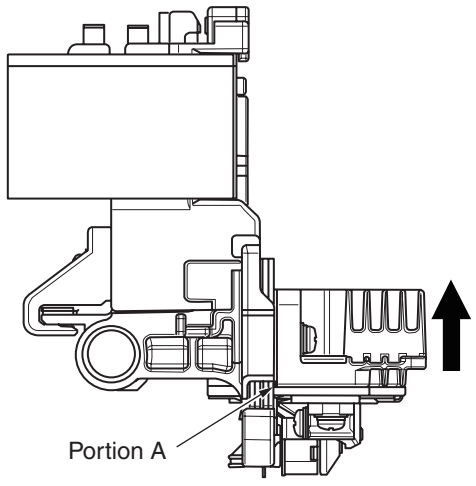
(5) Disconnect two Head cables, Carriage Home position sensor and Paper width sensor from the Print head ④ .

(6) Reassemble in the reverse order of disassembly.



(Precautions upon reassembly)

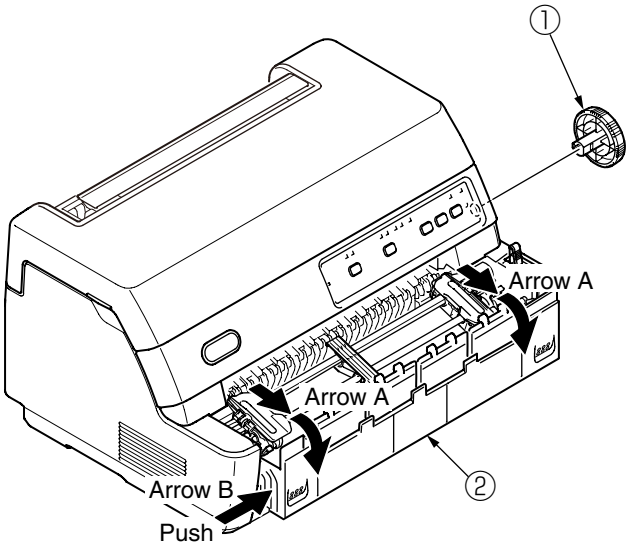
1. Assemble the Print head with rising to arrow A as it be in close contact with portion A.



5.2.2 Cover

(1) Power off, and remove the Platen knob ① .

(2) Pull and open the Stage assembly ② to arrow A, and push to arrow B to detach it.



(3) Open the Cover top ③, and push the portion A of Joint cover ④ to detach the Cover top ③.

(4) Unlatch three claws through the rectangle holes by using of the flat-blade screwdriver, and remove the Operation panel assembly ⑤ and disconnect the connector ⑥ .

(5) Remove two screws ⑦ to detach the Cover Middle ⑧ .

(6) Remove two screws ⑨ to detach the Cover Rear ⑩ .

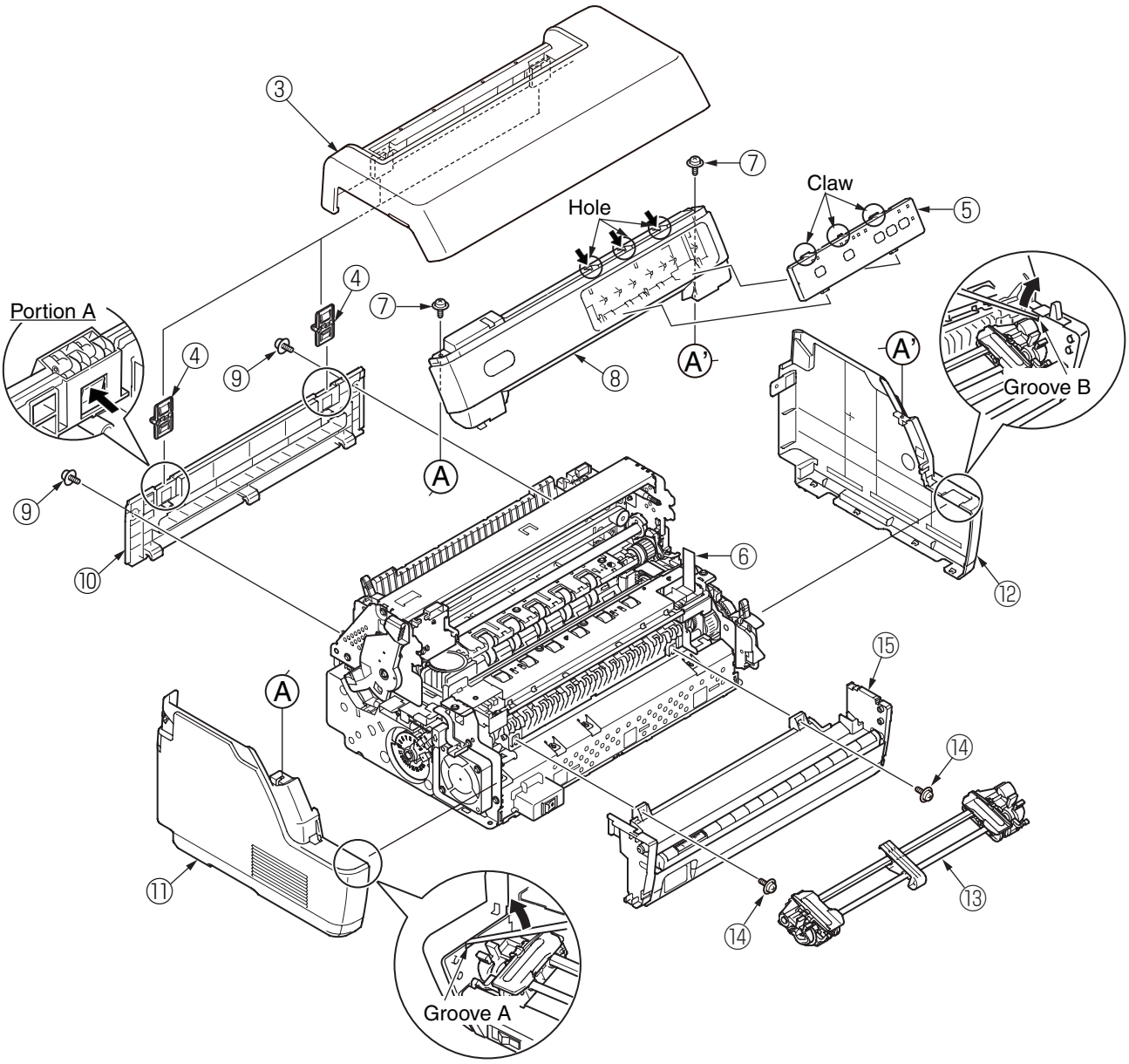
(7) Put in the flat-blade screwdriver to the groove A of the Cover Side L ⑪ , and turn it to remove the Cover Side L ⑪ .

(8) Put in the flat-blade screwdriver to the groove B of the Cover Side R ⑫ , and turn it to remove the Cover Side R ⑫ .

(9) Remove the Tractor assembly ⑬ .

(10) Remove two screws ⑭ to detach the Cover front ⑮ .

(11) Reassemble in the reverse order of disassembly.



5.2.3 Control board

(1) Power off.

(2) Disconnect the AC cord and Interface cables, and set the printer to turn upside down as following fig.A.

(3) Remove six screws ① to detach the Cover PCB ② .

(4) Disconnect all connectors from the Control board ③ .

<set the printer as follwing>

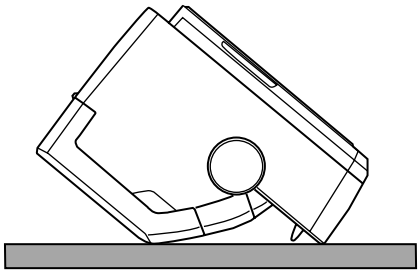
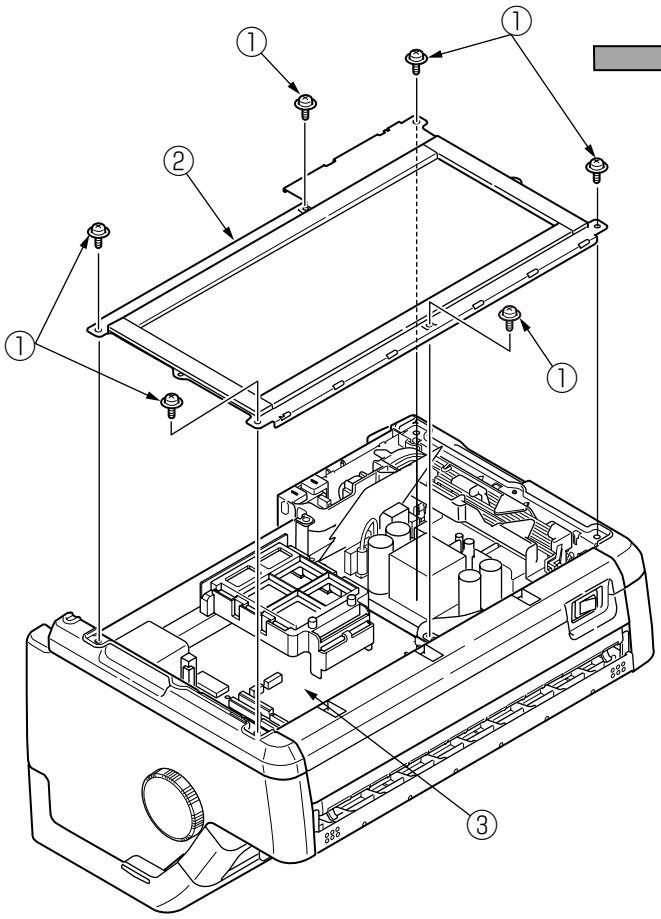
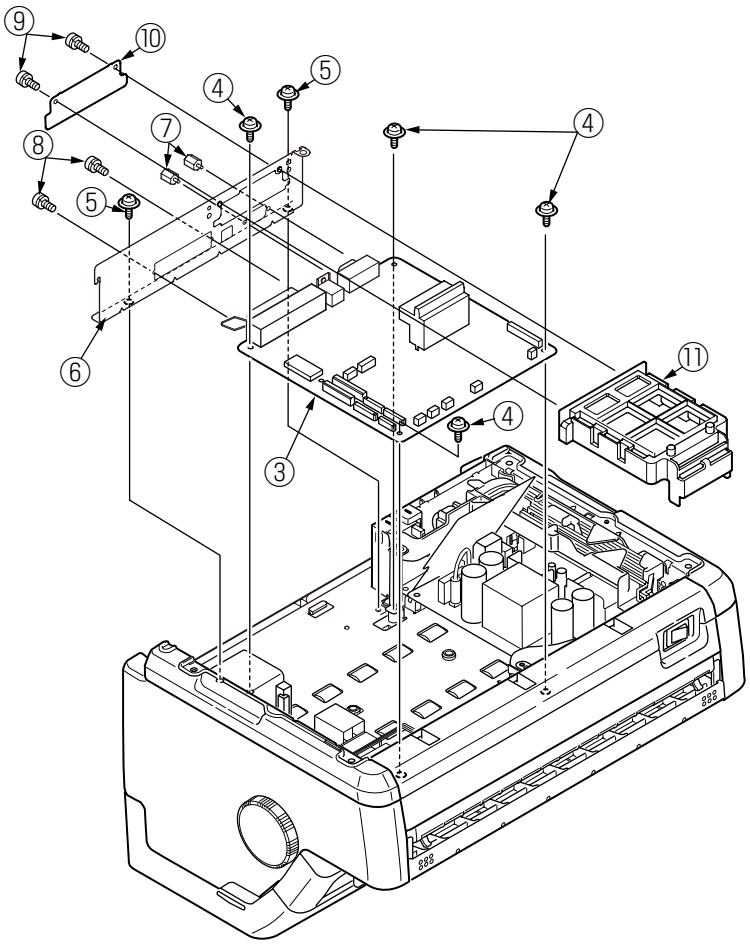


Fig. A



(5) Remove four screws ④ and two screws ⑤ to detach the control board ③ and Plate-PCB ⑥.

(6) Remove two hexangular screws ⑦ and two screws ⑧ and two screws ⑨ to detach the control board ③ and Plate-PCB ⑥ and plate blind ⑩ and holder PCB ⑪.



(7) Reassemble in the reverse order of disassembly.

Note!

Following the reassembly, set the slice level, correct the mode sensor and front rollerpositions, and set the skew sensor. (See Sections 6.1 to 6.7.)

After replacing the Control Board, take the following stesps to have the serial number of the printer unit written to the new Control Board.

1. Write the printer unit's serial number to the Control Board using a serial number registration utility. (For how to use the utility, see the operating manual of the utility.)
2. After writing is completed, run the printer menu, have the serial number printed, and check to make sure that it matches the serial number of the printer unit.

   Running the printer menu: See 6.8 Check the Serial Number.

5.2.4 Power supply unit

(1) Power off.

(2) Disconnect the AC cord and Interface cables, and set the printer to turn upside down as follwing fig.A.

(3) Remove six screws ① to detach the Cover PCB ② .

(4) Disconnect all connectors from the Power supply unit ③ .

(5) Remove four screws ④ to detach the Power supply unit ③ .

(6) Reassemble in the reverse order of disassembly.

<set the printer as follwing>

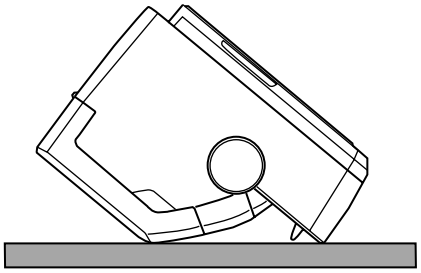
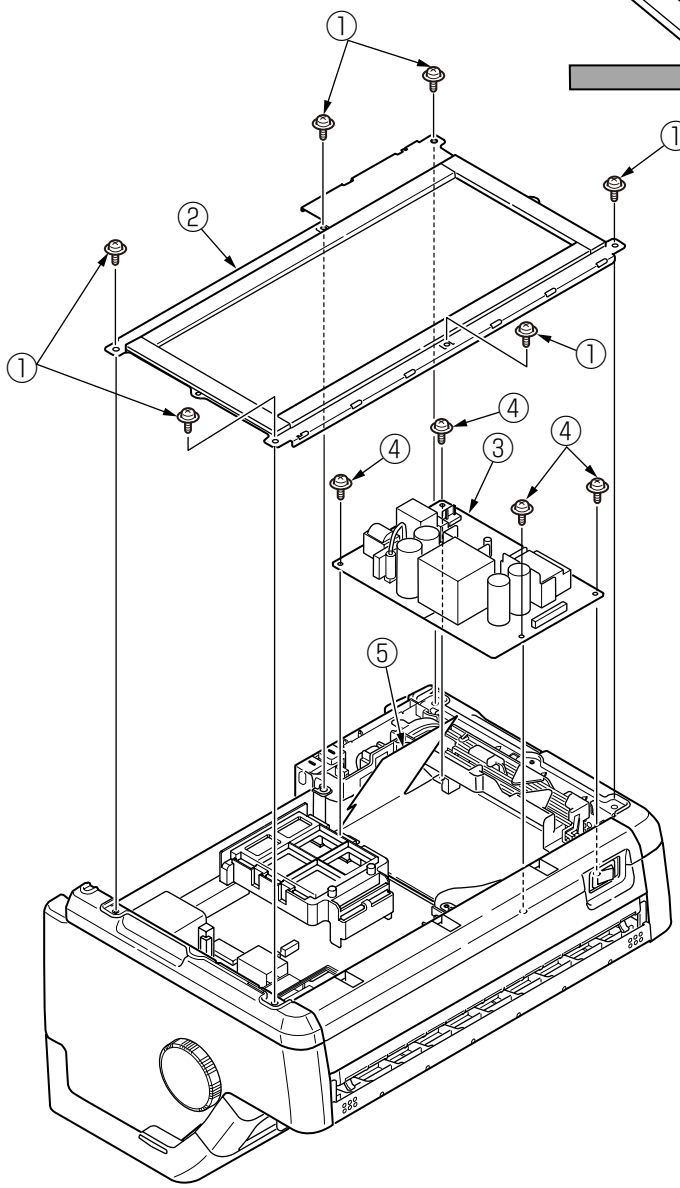
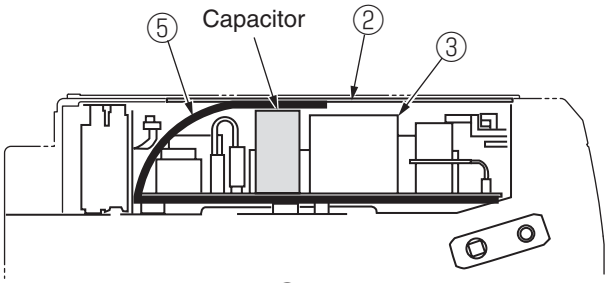


Fig. A

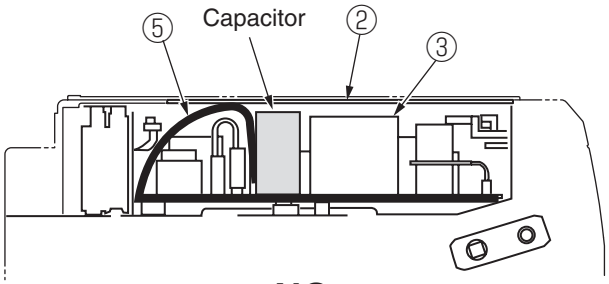


(Precautions upon reassembly)

Do not interfold the Sheet insulation ⑤ to the Capacitor on the Power Supply unit ③ .
(For to prevent of the contact of the Power supply unit ③ and the Cover PCB ② (it made by metallic material))



OK



NG

5.2.5 Head cables

(1) Remove Covers. (See 5.2.2)

(2) Remove the Print head. (See 5.2.1)

(3) Remove the Ribbon cassette.

(4) Remove six screws ① to detach the Cover PCB ② .

(5) Disconnect the HD1 connecter and HD2 connecter from the Control board ③ .

(6) Remove two screws ④ to detach the Plate side ⑤ .

(7) Remove two screws ⑥ to detach the Motor LF ⑦ .

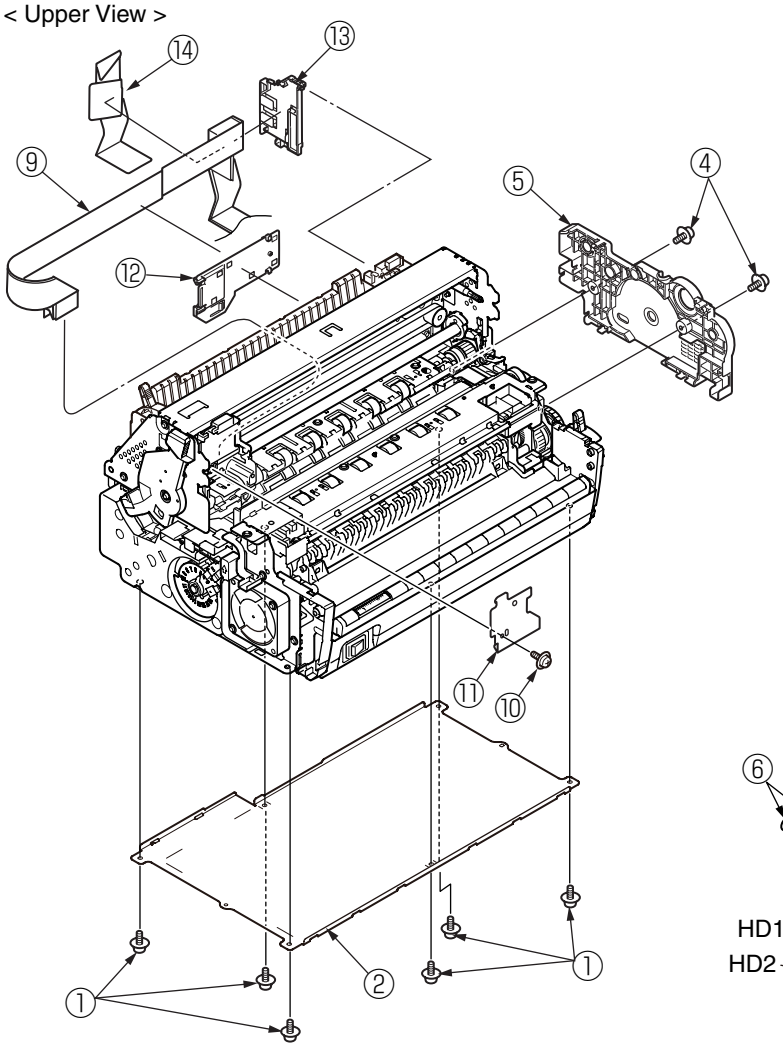
(8) Remove the Film guide cable B ⑧ , and unbend the Head cable ⑨ .

(9) Remove the screw ⑩ to detach the Film cable guide ⑪ .

(10) Remove the Guide cable A ⑫ , Guide cable B ⑬ and Film guide A ⑭ to detach the Head cable ⑨ .

(11) Reassemble in the reverse order of disassembly.

< Upper View >



< Put the printer as the following figure.>

Note! Set the Change lever to the direction of arrow(the Cut sheet position)

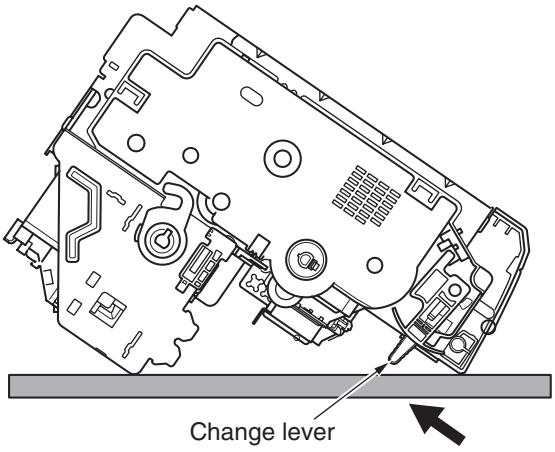
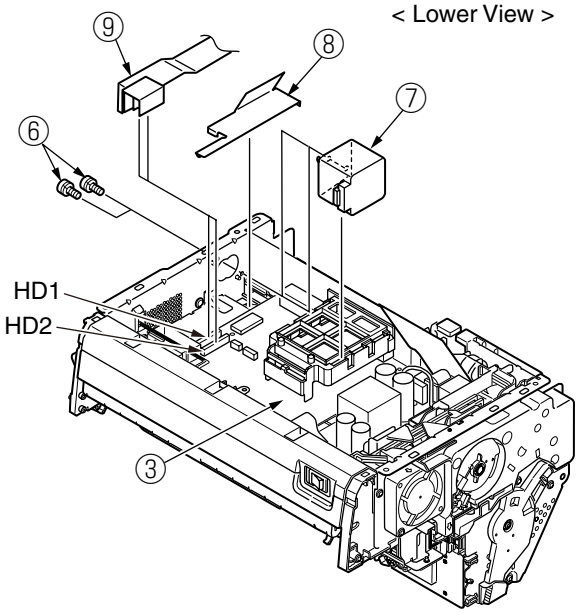


Fig. A

< Lower View >



5.2.6 Ribbon feed assembly

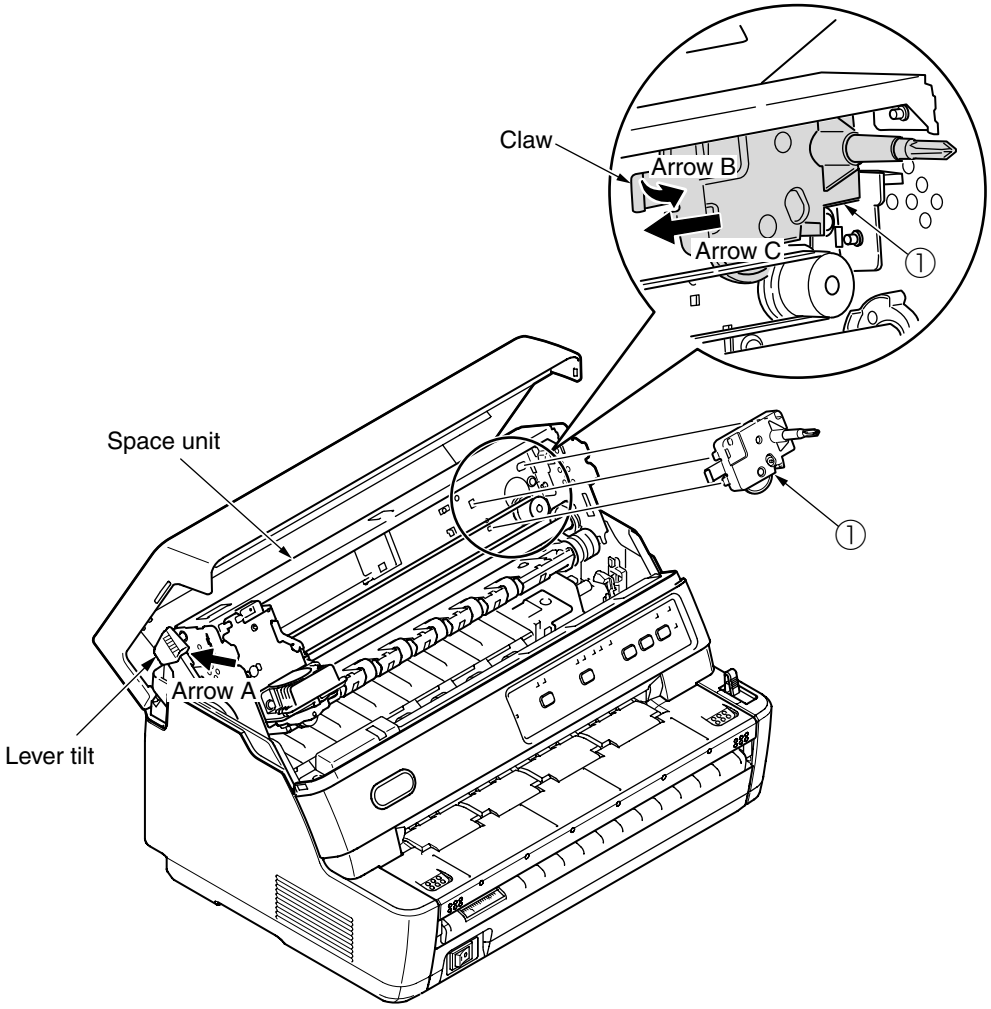
(1) Open the Cover-Top.

(2) Remove the Ribbon cassette.

(3) Turn the Lever tilt to direction of the arrow A to open the Space unit.

(4) Pull the Claw to direction of the arrow B, and slide to direction of the arrow C to detach the Ribbon feed assembly ① .

(5) Reassemble in the reverse order of disassembly.



5.2.7 Space motor

(1) Power off.

(2) Disconnect the AC cord and Interface cables, and set the printer to turn upside down as follwing fig.A.

(3) Remove six screws ① to detach the Cover PCB ② .

(4) Disconnect SPMOT ③ connectors from the Control board ④ .

<set the printer as follwing>

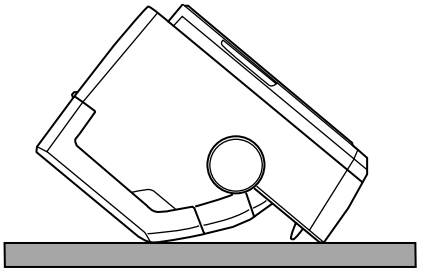
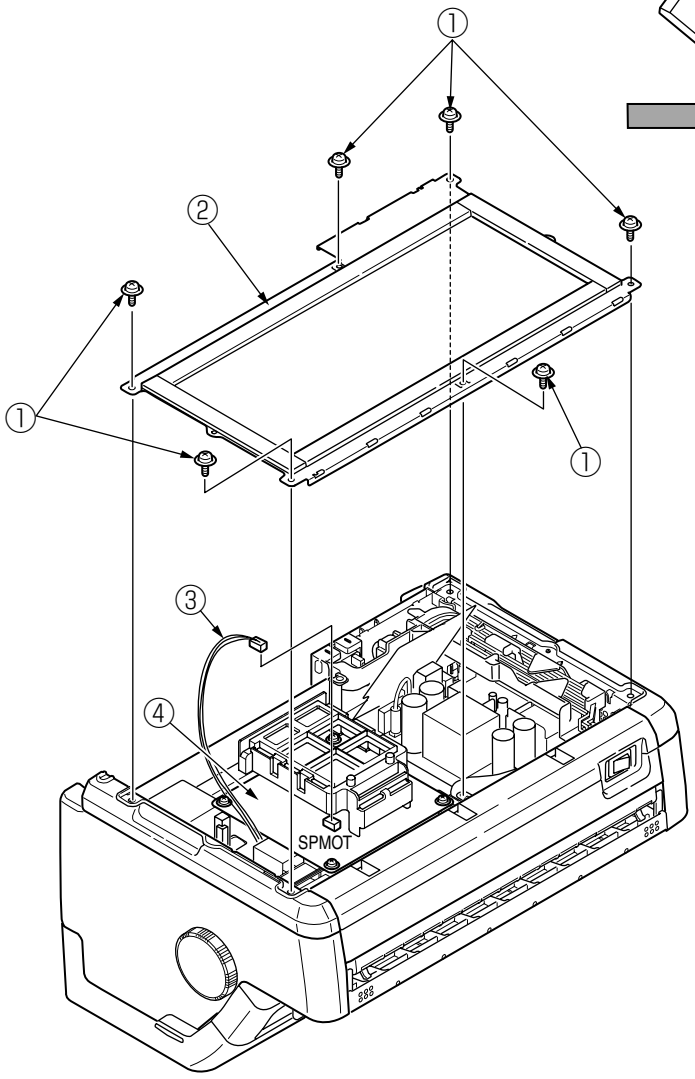


Fig. A



(5) Take the printer back to normal position, and remove covers. (See 5.2.2)

(6) Remove the Ribbon cassette.

(7) Remove two screws ⑤ and unlocked two locks to detach the Plate side ⑥ .

(8) Turn the Lever tilt to direction of the arrow A to open the Space unit.

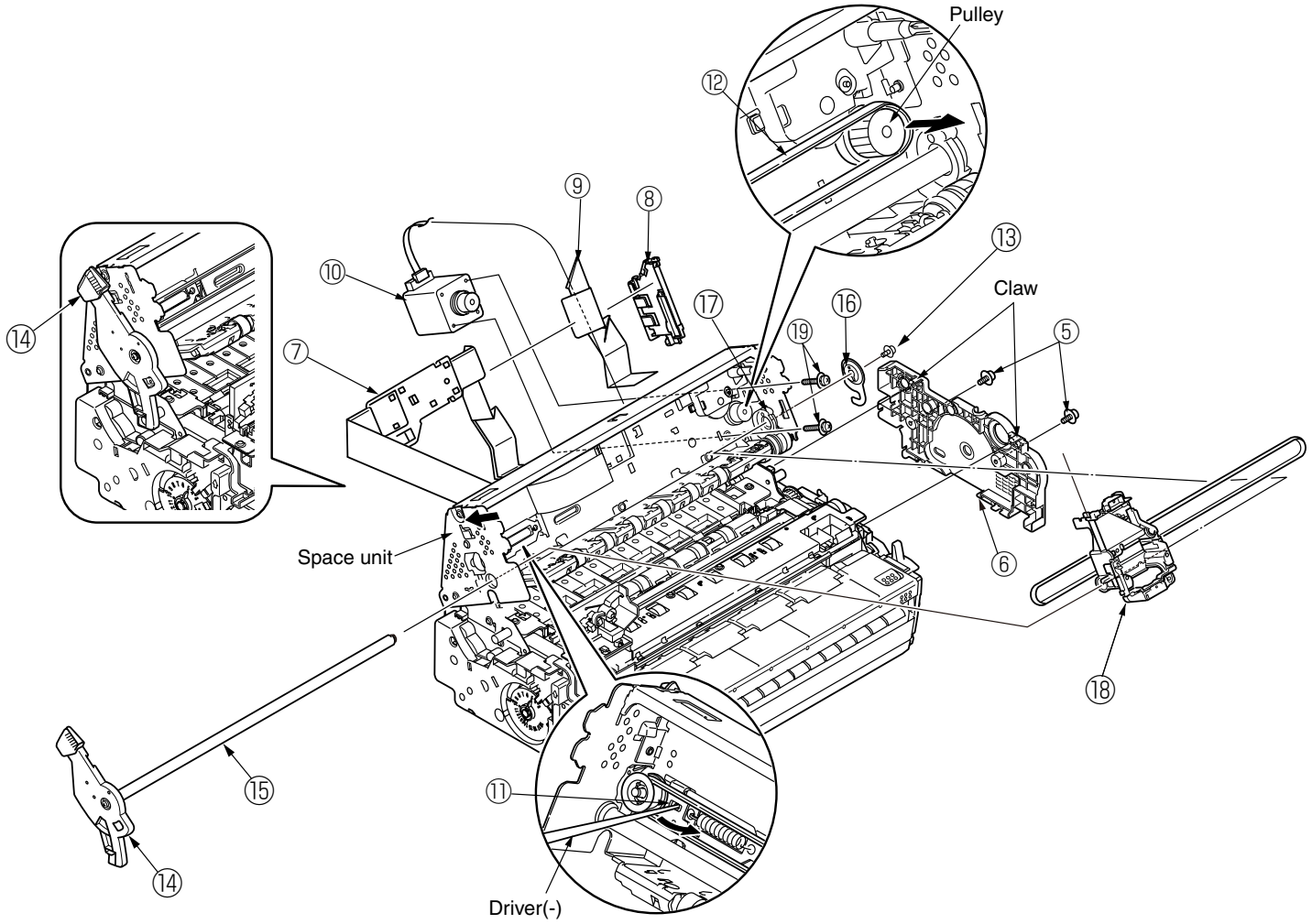
(9) Remove the Guide cable A ⑦ , Guide cable B ⑧ and Film guide A ⑨ to disconnect the cable of the Space motor ⑩ .

(10) Loosen a screw ⑪ , and tighten up a screw ⑪ with pry the bracket to the direction the arrow by using the flat-blade screwdriver for to loose space belt ⑫ .

(11) Remove a Screw ⑬ , and remove the Lever tilt ⑭ , Shaft main ⑮ , Plate gear roller LF ⑯ and Plate tilt ⑰ to detach the Frame carriage assembly ⑱ .

(12) Remove the Space belt ⑫ from the Pulley of the Space motor ⑩ and remove two screws ⑲ to detach the Spece motor ⑩ .

(13) Reassemble in the reverse order of disassembly.



Note!

To replace only the Space motor, following cover removal, disconnect the cable from the Space motor and follow the steps (8), (10), (11), and (12).

Reassemble in the reverse order of disassembly.

5.2.8 Base unit assembly

Note!

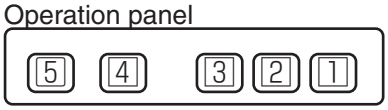
Do not turn the Yoing drive gear ㉒ along the way of the disassembly operation for to keep the phase of the mode.

(1) Power On with keeping to push SW [1], [2] and [3] on the Operation panel, and power off with keeping to push SW [4] and [1] in state of the Maintenance mode (Mode 5).

(2) Remove covers. (See 5.2.2)

(3) Remove the Ribbon cassette.

Operation panel



(4) Turn the Lever tilt to direction of the arrow A to open the Space unit.

(5) Remove two screws ① unlocked two locks to detach Plate side ②, Gear idle LF double ③, Gear roller LF A ④ , Gear roller LF B ⑤ and Gear idle LF ⑥ .

(6) Turn the claw of Gear slit mode sensor ⑦ , and detach it.

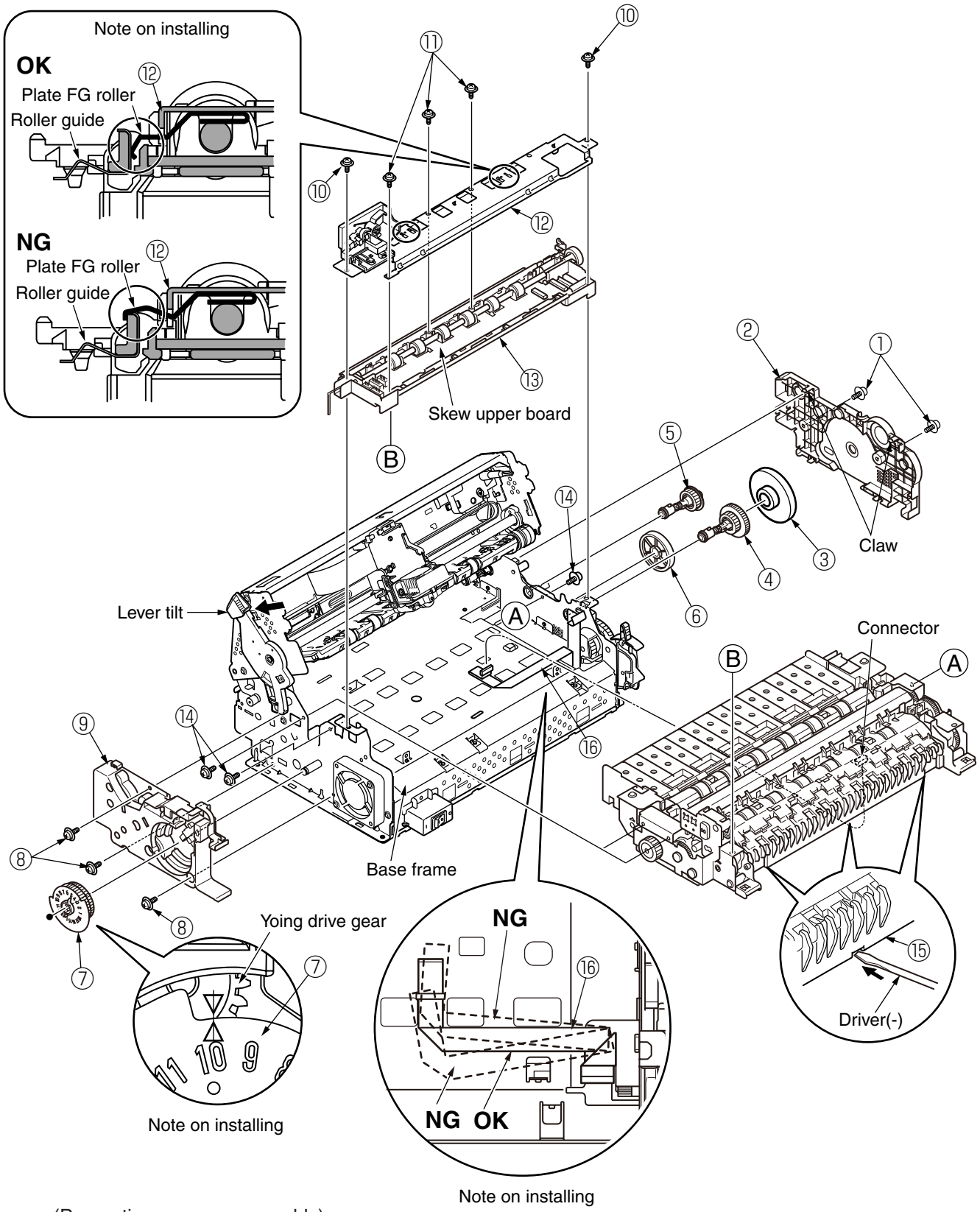
(7) Remove three screws ⑧ to detach the Bracket side flame L ⑨ .

(8) Remove two screws ⑩ and three screws ⑪ to detach the Plate reinforcing ⑫ .

(9) Disconnect all connecers and cables of cover open sensor, mode motor and mode sensor on the OR Skew upper Board to detach the Guide sheet front upper ⑬ .

(10) For to detach the Base unit assembly ⑮ , remove three screws ⑭ , and take off the craw located the front side and near the center of the Base unit assembly ⑮ by using flat-blade screwdriver, and disconnect the cable ⑯ from connector.

(11) Reassemble in the reverse order of disassembly.



(Precautions upon reassembly)

1. Reassemble the Base unit assembly ⑮ without the Cable ⑯ be laid above the rectangle hole of the Base frame.
2. Reassemble the Base unit assembly ⑮ with conforming to △ marks on the Gear slit mode sensor ⑦ and yoing driver gear.
3. Be careful the Plate FG roller that is assembled on Plate reinforcing ⑫ be not laid onto Roller guide.
4. Assembly the Guide sheet front upper ⑬ with against the back side
5. After reassembling the Cable ⑯ , fixed it with Scotch tape.

Note!

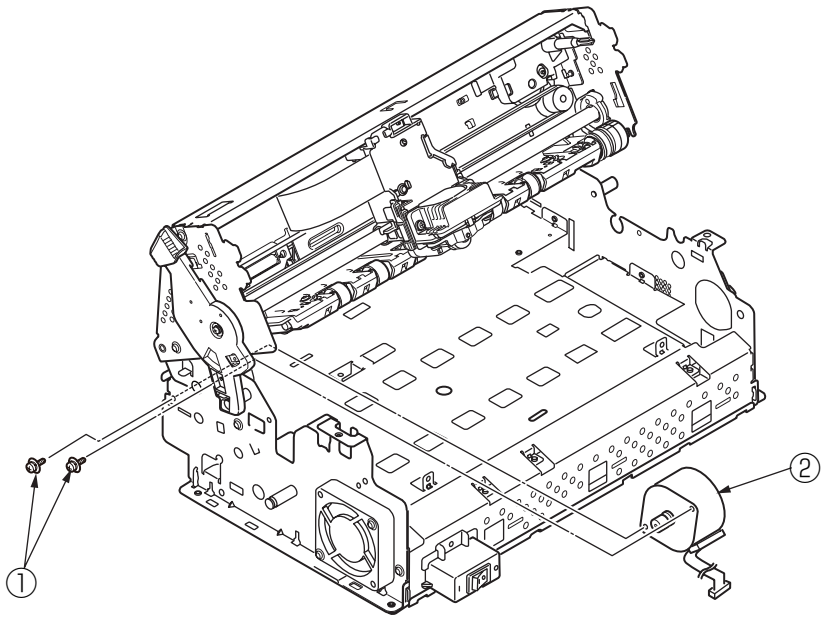
Following the reassembly, carry out the adjustments of 6.1 to 6.7.

5.2.9 Mode motor

(1) Remove the Base unit assembly. (See 5.2.8)

(2) Remove two screws ① to detach the Mode motor ② .

(3) Reassemble in the reverse order of disassembly.



Note!

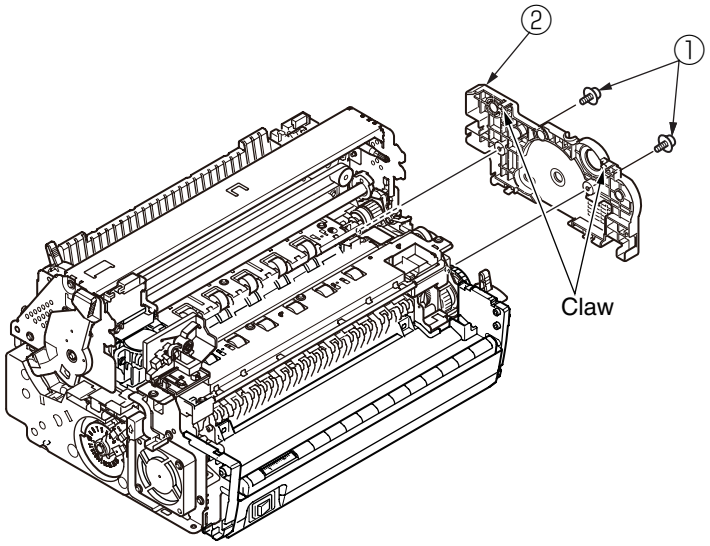
Following the reassembly, set the slice level, correct the mode sensor and front roller positions, and set the skew sensor. (See Sections 6.1 to 6.7)

5.2.10 LF motor

(1) Remove covers. (See 5.2.2)

(2) Remove the Ribbon cassette.

(3) Remove two screws ① and unlocked two locks to detach the Plate side ② .



(4) Set the printer to turn upside down as follwing fig.A.

Note!

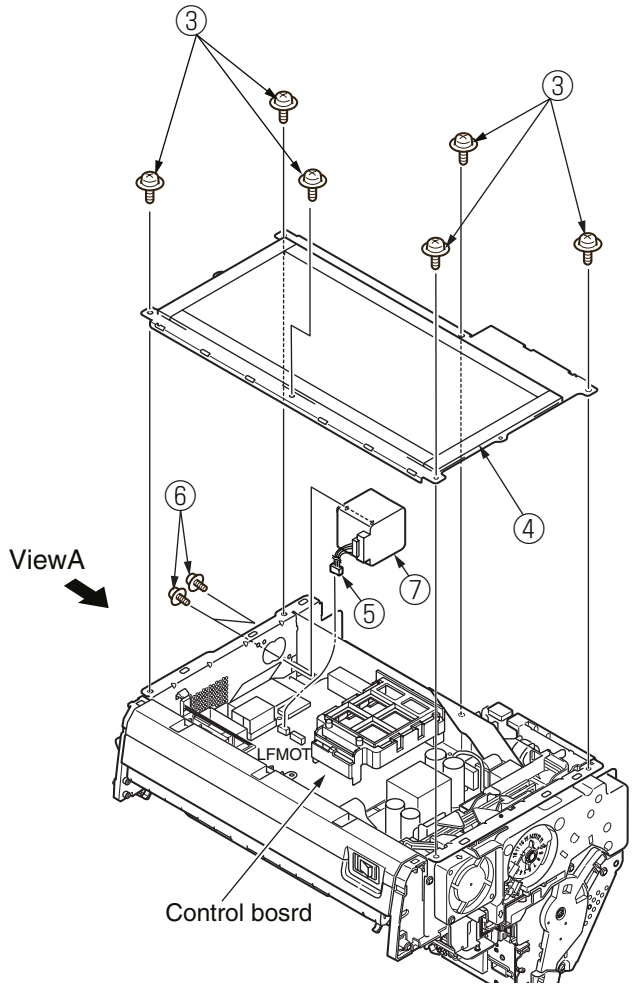
Set the Change lever to the 'Cut paper' (direction to arrow).

(5) Remove the six screws ③ to detach the Cover PCB ④ .

(6) Disconnect the LFMOT connecter that is connected to the Control board ⑤ .

(7) Remove two screws ⑥ to detach the Motor LF ⑦ .

(8) Reinstall in the opposite sequence to removal.



< Put the printer as the following figure.>

Note! Set the Change lever to the direction of arrow(the Cut sheet position)

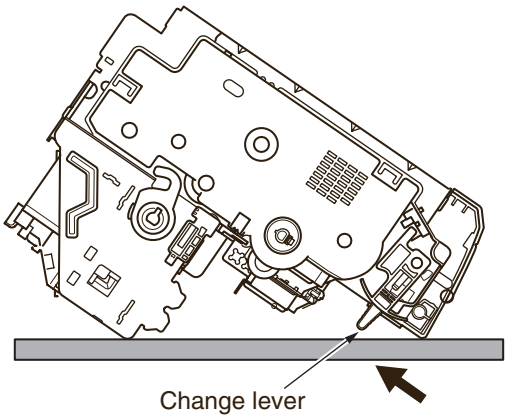
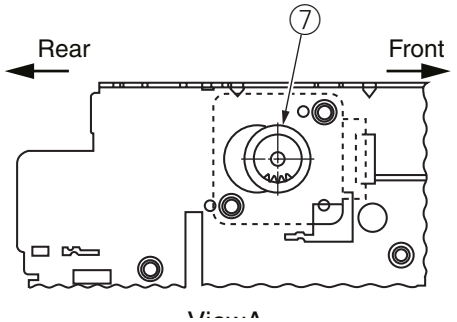


fig.A



(Precautions upon reinstalling)

1. Reassemble the Motor LF ⑦ to the assembly position of front side.

5.2.11 Skew upper board

(1) Remove covers. (See 5.2.2)

(2) Remove the Ribbon cassette.

(3) Turn the Lever tilt to direction of the arrow A to open the Space unit.

(4) Remove two screws ① and three screws ② to detach Plate reinforcing ③ .

(5) Disconnect all connecters from the Skew upper board ④ to detach the Guide sheet front upper ⑤ .

(6) Remove the Gear roller LF U ⑥ , and pull and slide to right the Roller feed lower ⑦ and the shaft of the roller at right side of the Roller feed lower ⑧ to detach the Roller feed lower ⑧.

(7) Warp to lower the portion of the front side and near the center of the Guide sheet front upper ⑤, and slide to front side the Skew upper board ④ to detach the Skew upper board ④.

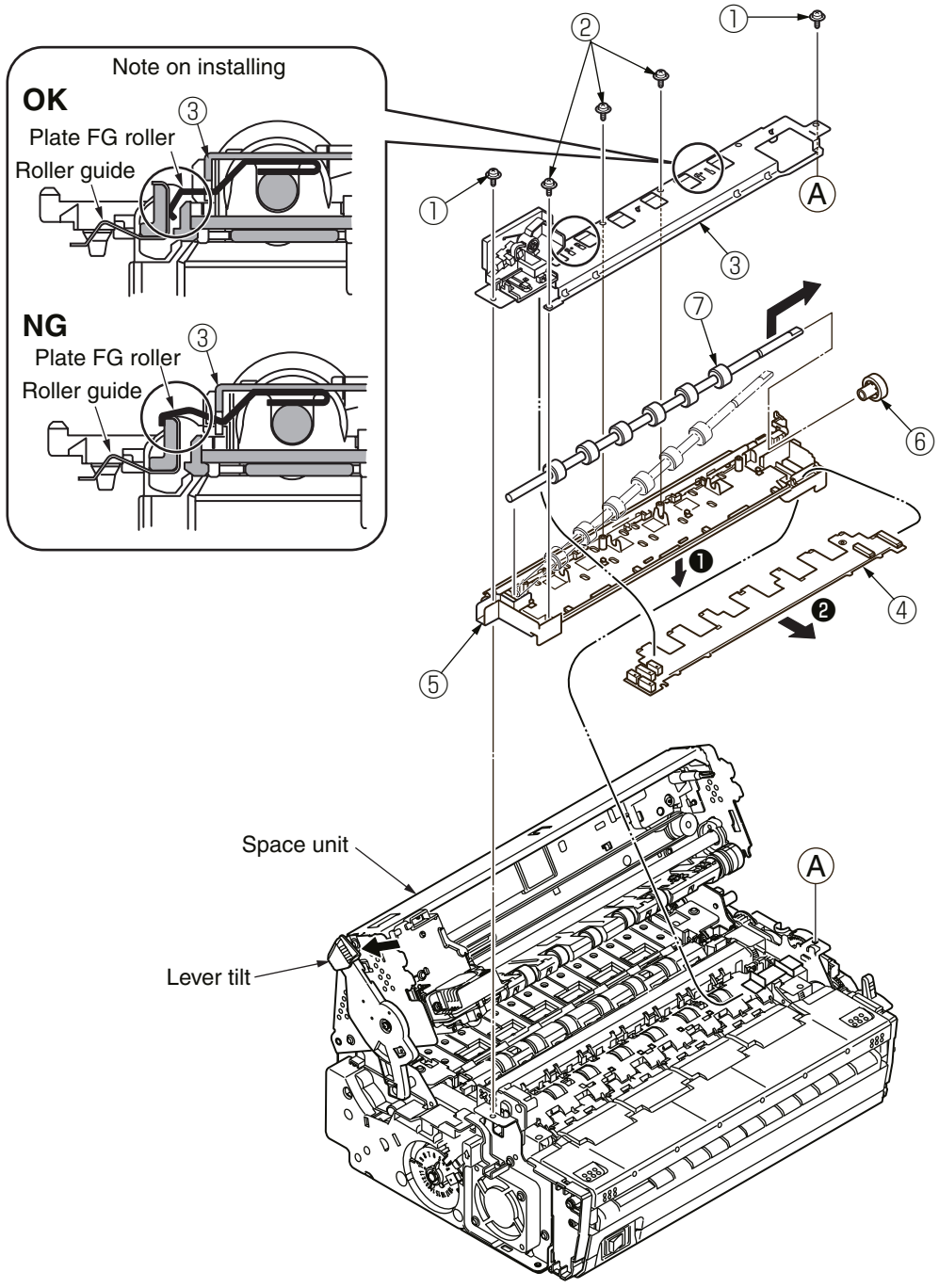
(8) Reinstall in the opposite sequence to removal.

(Precautions upon reinstalling)

1. Do not lay the Plate FG roller that is assembled in the Plate reinforcing ③ on the Roller guide.

Note!

Following the reassembly, carry out the adjustments of 6.1 to 6.7.



Note!

Following the reassembly, carry out the adjustments of 6.1 to 6.7.

5.2.12 Skew lower board

(1) Remove covers. (See 5.2.2)

(2) Remove the Ribbon cassette.

(3) Turn the Lever tilt to direction of the arrow A to open the Space unit.

(4) Remove the Base unit. (See 5.2.8)

(5) Drag to upward the left side ot the Front sheet guide assembly (lower) ① and the roller shaft to detach Front sheet guide assembly (lower) ① .

(6) Slide the Skew lower board ② to right to detach it with to keep unlocking the lock of the Mecha chassis that is holding the Skew lower board ② be pushed by using flat-blade screwdriver.

(7) Disconnect the Cable ③ from Skew lower board ② .

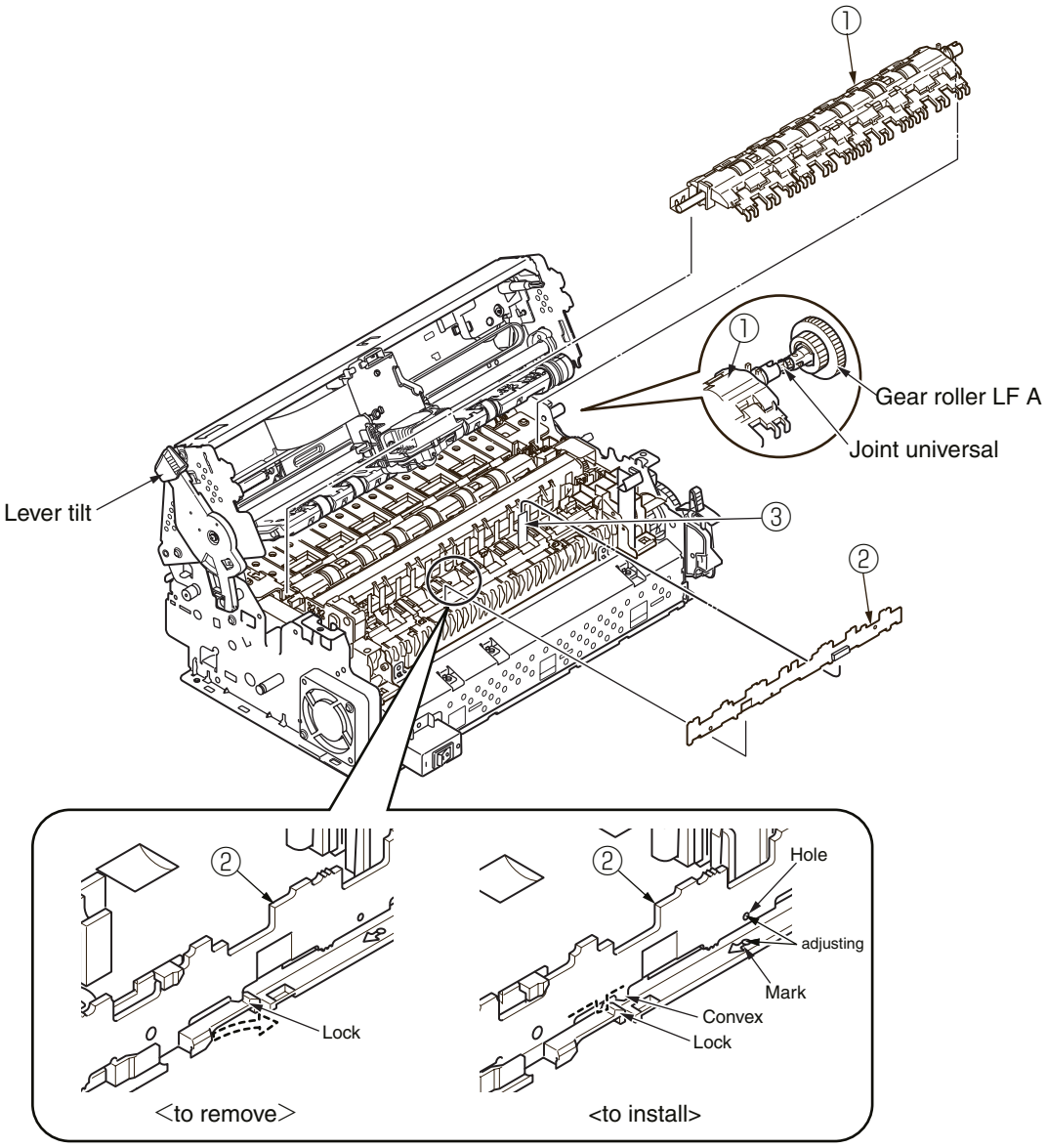
(8) Reinstall in the opposite sequence to removal.

(Precautions upon reinstalling)

1. Lock the convex portion of the Skew lower board ② to the locking portion of the Mecha chassis with conforming to the hole of Skew lower board ② and Mecha chassis marking and slide to left the Skew lower board ② in the reassembly the Skew lower board ② .
2. Lay the extra length of the Cable ③ into the wiring enclosure of the Mecha chassis.
3. Connect the Gear roller LF A and Joint universal in the reassembling the Front Sheet guide assembly (Lower) ① .
4. Do not lay the Plate FG roller on the Roller guide.

Note!

Following the reassembly, carry out the adjustments of 6.1 to 6.7.



Note!

Following the reassembly, carry out the adjustments of 6.1 to 6.7.

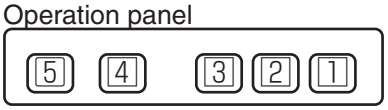
5.2.13 Mode sensor

Note!

Do not turn the Yoing drive gear along the way of the disassembly operation for to keep the phase of the mode.

(1) Power On with keeping to push SW [1], [2] and [3] on the Operation panel, and power off with keeping to push SW [4] and [1] in state of the Maintenance mode (Mode 5).

Operation panel



(2) Remove covers. (See 5.2.2)

(3) Remove the Ribbon cassette.

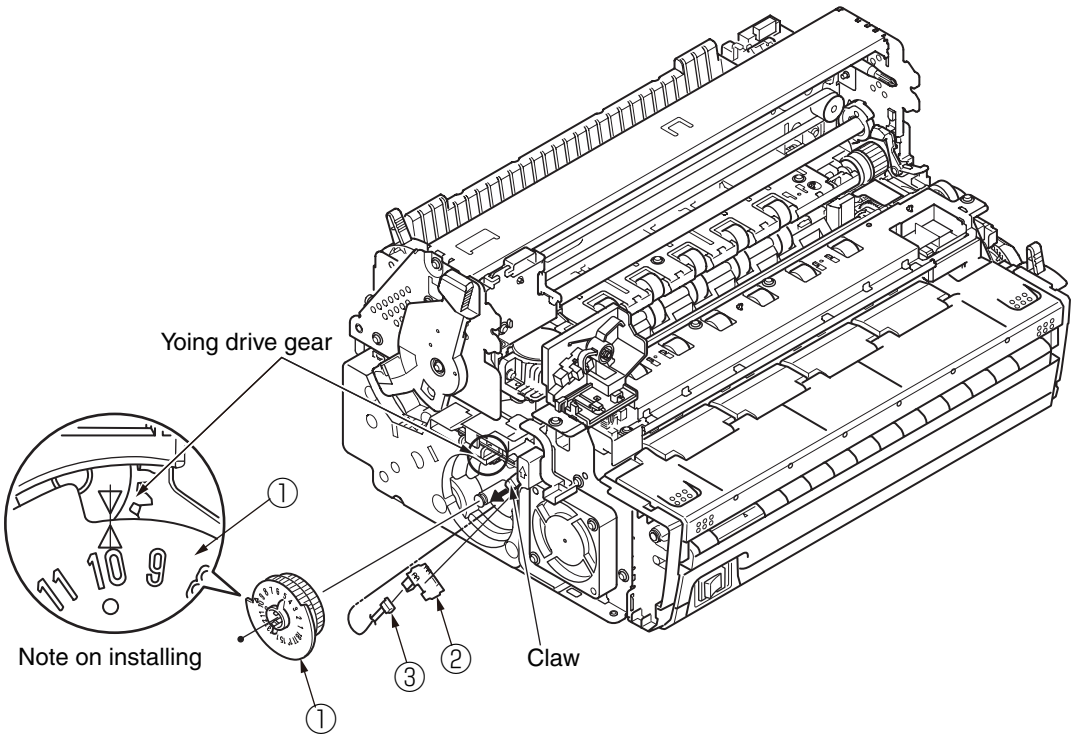
(4) Remove the Plate reinforcing. (See 5.2.8)

(5) Turn the craw of the Gear slit mode sensor ① to detach it.

(6) Warp the lock portion of the Bracket side flame L to the direction of the arrow to detach the Mode sensor ② .

(7) Remove the Code ③ from the Mode sensor ② .

(8) Reinstall in the opposite sequence to removal.



(Precautions upon reinstalling)

1. Reassemble the Gear slit mode sensor ① with conforming to △ marks on the Gear slit mode sensor ① and yoing driver gear.

5.2.14 Cover open sensor

(1) Remove covers. (See 5.2.2)

(2) Remove the Ribbon cassette.

(3) Turn the Lever tilt to direction of the arrow A to open the Space unit.

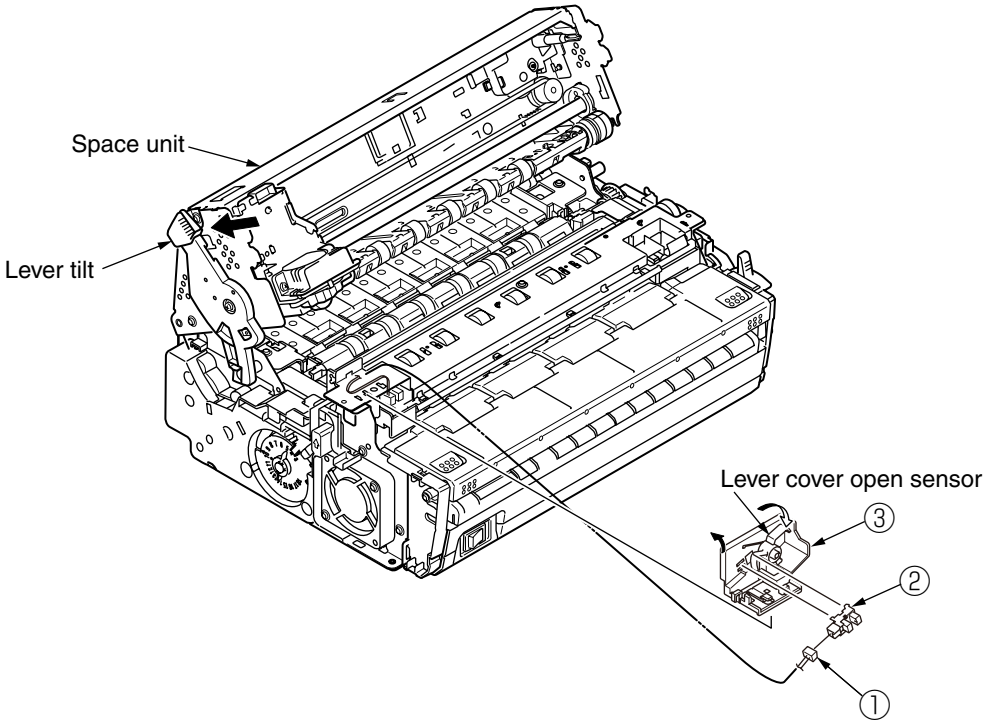
(4) Disconnect the Code ① from the Sensor ② .

(5) Warp and slide to front side the portion locking of the Bracket cover open sensor ③ to detach it.

(5) Warp to the direction of the arrow A and slide to front side the portion locking of the Bracket cover open sensor ③ to detach it.

(6) Remove the Sensor ② with keeping to push to the arrow (same as the clock rotation) in the following figure.

(7) Reinstall in the opposite sequence to removal.



5.2.15 Paper width sensor

(1) Remove covers. (See 5.2.2)

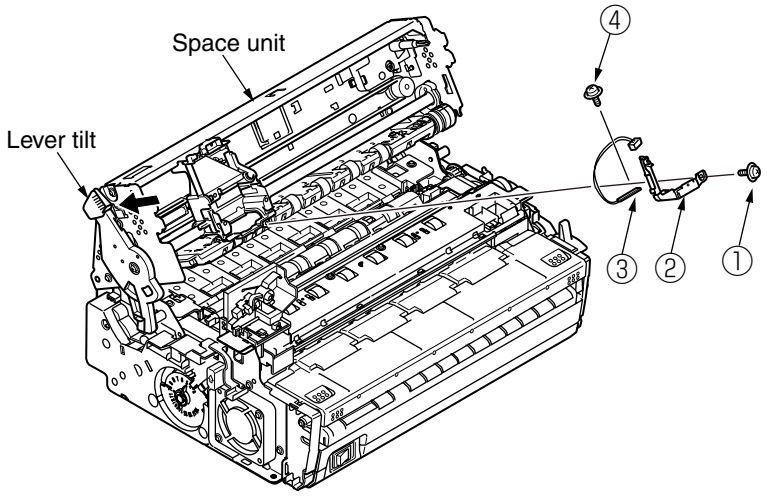
(2) Remove the Ribbon cassette.

(3) Remove the Print head. (See 5.2.1)

(4) Remove a Screw ① to detach the Cover sensor ② and the Paper Width sensor ③ .

(5) Remove the screw ④ from the Paper Width sensor ③ .

(6) Reassemble in the reverse order of disassembly.

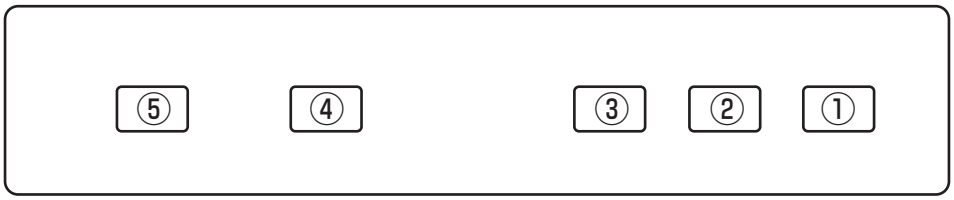


6. ADJUSTING

- Adjustment is carried out after attaching all the covers.
- Adjustment is carried out on a flat table.(Plane level 1mm or less)

6.1 Table sensor, skew sensor and paper width sensor slice level Adjust

It is the number of the switch to use for explanation.



Setting condition

- Change-Lever is made into the cut paper side.
- Ribbon cassette is set.
- Use Paper is 1 of A4-55kg.

Adjusting method

(1) Turn on power while holding SW ① , SW ② and SW ③ .

(2) While pushing SW ③ , push SW ⑤ .

(3) Cut paper (A4-55kg) is set.

(4) It checks that the adjustment value of table sensor and skew sensor is adjusted to the range of GAIN 2 to 5.

(5) When "GAIN 6-8" came, it's adjusted by the following procedure.

- Mounting of a sensor board is checked once again.
- When "GAIN 6 to 8" came once again, GAIN setting exchanges a sensor substrate (SKU substrate and SKL substrate).

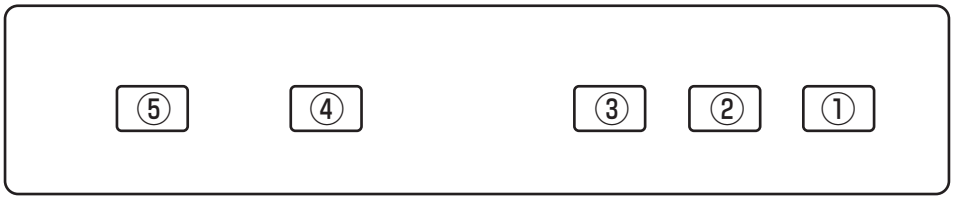
(6) After reassembled, Carry out above (1) to (4).

[Printout result sample]

```
ML895FP   EIO  X  F/W XX.XX   45449501YR-XX
                       LD  XX.XX

 PAPER WIDTH SENSOR SLICE ADJUST
 SLICE LEVEL 0.55V (GAIN 0)
 A/D CON VALUE 0x0012

 TABLE SENSOR SLICE LEVEL ADJUST
   SENSOR 1          2.08 V      (GAIN 3)
   SENSOR 2          2.08 V      (GAIN 3)
   SENSOR 3          2.08 V      (GAIN 3)

 SKEW SENSOR SLICE LEVEL ADJUST
   SENSOR 1          1.01 V      (GAIN 3)
   SENSOR 2          1.01 V      (GAIN 3)
   SENSOR 3          1.01 V      (GAIN 4)
   SENSOR 4          1.01 V      (GAIN 3)
   SENSOR 5          1.01 V      (GAIN 3)
   SENSOR 6          1.01 V      (GAIN 4)
   SENSOR 7          1.01 V      (GAIN 3)
   SENSOR 8          1.01 V      (GAIN 3)
```

6.2 Mode sensor detection compensation (backlash compensation)

It is the number of the switch to use for explanation.



Setting condition

- Change-Lever is made into the cut paper side.
- Ribbon cassette is set.

Setting method

(1) Turn on power while holding down SW ① , SW ② and SW ③ .

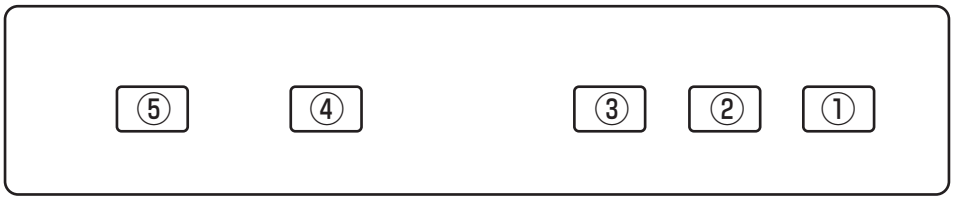
(2) While pushing SW ④ , push SW ① .

(3) A mode position stops in the mode 5.

(4) After the end of a printer of operation, Turn off power.

6.3 Front roller position compensation

It is the number of the switch to use for explanation.



Setting condition

- The middle cover and the bracket cover open sensor are detached.
- Change-Lever is made into the cut paper side.
- Paper to be used:
  A piece of A4 (width 210 mm × length 297 mm) paper (55 kg) in portrait, and a piece of A6 (width 105 mm × length 148 mm) paper (55 kg) in portrait

Setting method

(1) Turn on the power while holding down the SW ① , SW ② and SW ③ on the operation panel.

(2) While holding down the SW ④ , press the SW ② on the operation panel.

(3) Adjust the upper and lower of the front roller. (See ❶ , ❷ and ❸ described below.)

(4) Press the SW ⑤ on the operation panel.

(5) Check that indication of A and B changes from A: glowing yellowish green / B: red light blinking to A: yellowish green blinking / B: glowing red on the operation panel.

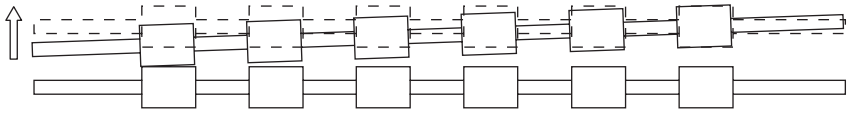
(6) Turn off the printer.

❶ Adjusting the parallelism of the front roller

1. Make a piece of A4 (width 210 mm × length 297 mm) paper (55 kg) in portrait fed and then check the feed force balance between the right and left sides of the roller by pinching the midpoint at the bottom edge of the paper.

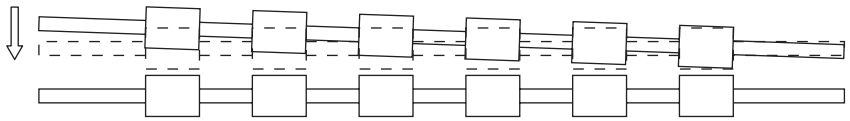
Pattern A

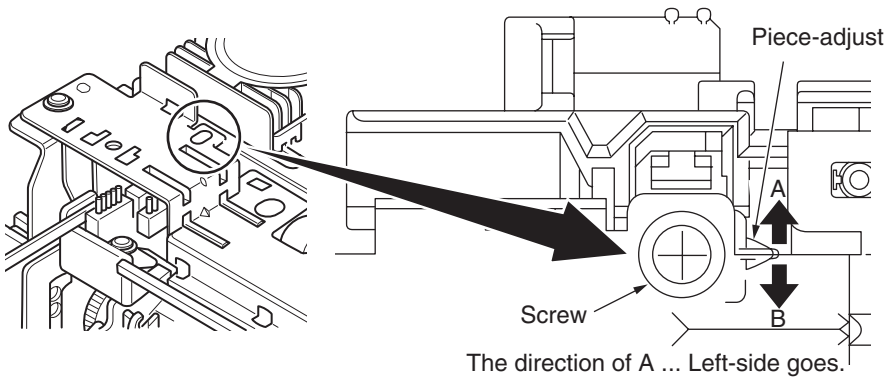
A4 paper being skewed to the right (insufficient feed force of the right side)
→ Move the piece-adjust in the direction of A in the illustration below.



Pattern B

A4 paper being skewed to the left (insufficient feed force of the left side)
→ Move the piece-adjust in the direction of B in the illustration below.





The direction of A ... Left-side goes.
The direction of B ... Left-side falls.

❷ Adjusting the gap between the upper and lower of the front roller

1. Adjust the gap between the upper and lower of the roller to 0.01 to 0.05 mm.

   Pattern A

   Too big gap

   → Press the SW ① on the operation panel. (One press decreases the gap by approx. 0.05 mm.)

   Pattern B

   Too small gap

   → Press the SW ① while holding down SW ④ on the operation. (One press increases the gap by approx. 0.05 mm.)

   * If the roller position adjustment causes uneven feed force balance between the right and left sides of the roller more once adjusted by ❶ , adjust the parallelism of the front roller again.

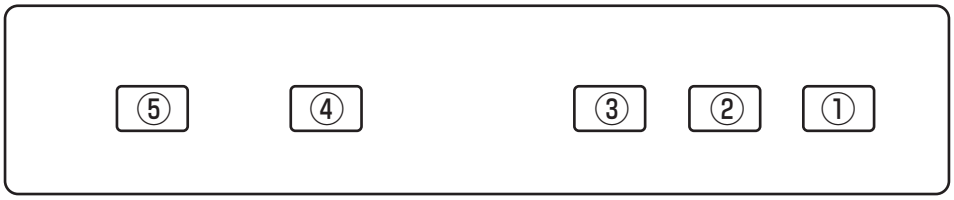
2. Insert a piece of A4 (width 210 mm × length 297 mm) paper (55 kg) in portrait at the midpoint of the roller. Check the paper feed balance between the right and left sides of the paper while the roller is rotating for about 10 seconds following insertion of the paper.

❸ Checking the parallelism of the upper and lower of the front roller

1. Insert a piece of A6 (width 105 mm × length 148 mm) paper (55 kg) at the left side/ midpoint/right side of the roller. Check the paper feed balance between the right and left sides of the paper while the roller is rotating for about 10 seconds following insertion of the paper. The paper feed balance between the right and left sides must be almost even.

6.4 Skew sensor position adjustment

It is the number of the switch to use for explanation.



Setting condition

· Change-Lever is made into the cut paper side.
· Ribbon cassette is set
· Use paper is 1 of 245mm x 210mm 1P(90kg)

Adjusting Method

(1) Turn on power while holding SW ① , SW ② and SW ③ .
(2) While pushing SW ③ , push SW ④ .
(3) Cut paper (245mm x 210mm 1P(90kg)) is set in a stage.
· Insert straight the paper
(4) Confirmed that following contents are printed out.

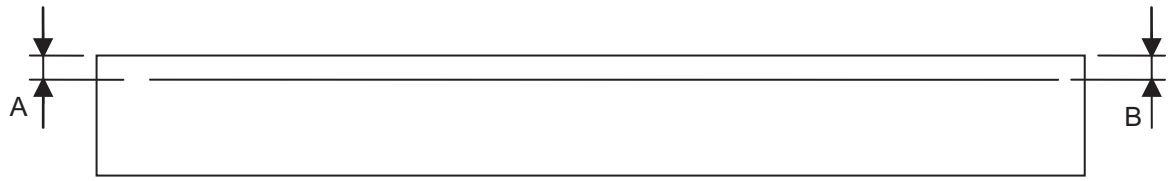
[Printout result sample]

ML895FP EIO X F/W XX.XX 45449501YR-XX
LD XX.XX

SKEW SENSOR POSITION ADJUST

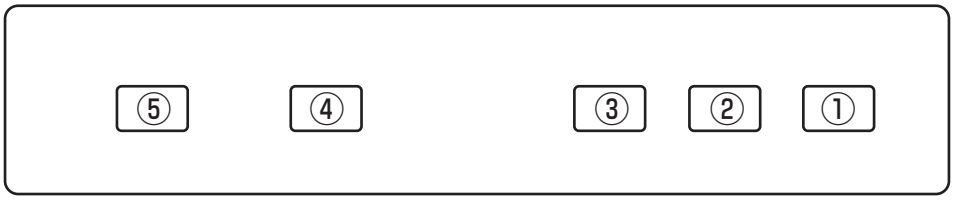
SENSOR 1	0
SENSOR 2	0
SENSOR 3	-2
SENSOR 4	0
SENSOR 5	+1
SENSOR 6	+2
SENSOR 7	+3
SENSOR 8	+4

5 When a skew is more than 0. 5(|A-B| ≧ 0.5),
Established once again by a procedure of the above 1-4.

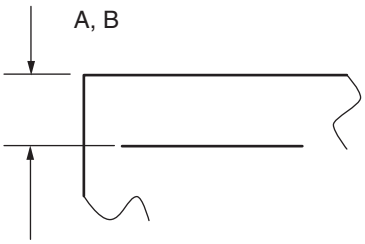


6.5 First line position Adjustment

It is the number of the switch to use for explanation.



Specification



Paper		First line position
A	Cut paper (Stage)	6.35±0.5mm
B	Continuous paper (Front)	6.35±0.5mm

Confirmation method

(1) Turn on power while holding SW ① and SW ② .

(2) While pushing SW ② , push SW ① .

(3) Cut paper (1P 55kg paper) is set. or continuation paper is set

· Local printing test is started by setting a paper.

· Print the first line finished, push the SW ① and stop it.

· Push the SW ③ and output paper.

(4) Measurement is First line and the distance of the paper edge.

· Check going into a standard value.

· When are not included in the standard value, please carry out item (5) to (12)

Adjusting method

(5) Turn on power while holding SW ② and SW ③ .

(6) While pushing SW ① , push SW ④ .

(7) Cut paper (1P 55kg paper) is set.

· Printed with a menu print by setting paper.

(8) While pushing SW ④ , push SW ③ . This operation is performed twice.

(9) In the case of a cut sheet, push SW ② five times.

In the case of a Continuous paper, push SW ② four times.

(10) Perform the adjustment of the cut sheet at

"Technical TOF Base Adjust(Cut Feed) 0" and a printed place.

Perform the adjustment of the Continuous paper at

"Technical TOF Base Adjust(Front Feed) 0" and a printed place.

(11) A compensation value is chosen SW ① .(or While pushing SW ④ , push SW ① .)

· The amount of change, please look at the Table 6.5.

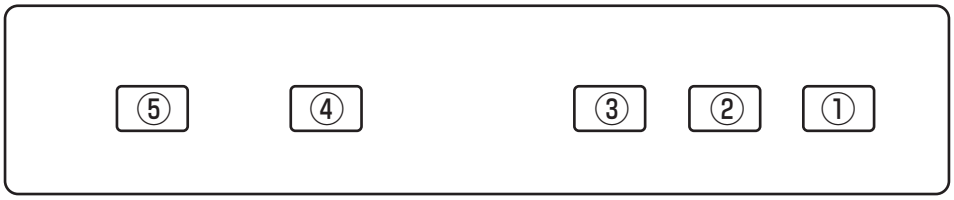
(12) If a target setting value is reached, push SW ⑤ and it is made to complete.

Table 6.5 Top first line correction

Preset	Correction
+30	Move 30/180 inch (4.23 mm) down from the reference position.
⋮	⋮
+3	Move 3/180 inch (0.42 mm) down from the reference position.
+2	Move 2/180 inch (0.28 mm) down from the reference position.
+1	Move 1/180 inch (0.14 mm) down from the reference position.
0	Reference position
-1	Move 1/60 inch (0.42 mm) up from the reference position.
-2	Move 2/60 inch (0.85 mm) up from the reference position.
-3	Move 3/60 inch (1.27 mm) up from the reference position.
⋮	⋮
-30	Move 30/180 inch (4.23 mm) up from the reference position.

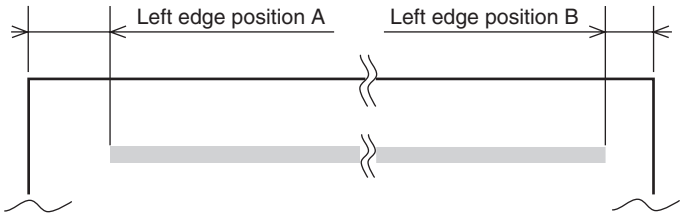
6.6 Left edge and right edge position adjustment

It is the number of the switch to use for explanation.



Specification

	Spec.
Left edge position A	5.08±0.5mm
Right edge position B	1.00±0.5mm



Confirmation method

(1) Turn on power while holding SW ① and SW ② .

(2) While pushing SW ② , push SW ① .

(3) Cut paper (A5 Vertical 1P 55kg paper) is set. or continuation paper is set.

· Local printing test is started by setting a paper.

· Print the first line finished, push the SW ① and stop it.

· Push the SW ③ and output paper.

(4) Measurement is First line and the distance of the paper left edge and right edge.

· Check going into a standard value.

· When are not included in the standard value, please carry out item (5) to (12).

Adjusting method

(5) Turn on power while holding SW ② and SW ③ .

(6) While pushing SW ① , push SW ④ .

(7) Cut paper (A5 Vertical 1P 55kg paper) is set.

· Printed with a menu print by setting paper.

(8) While pushing SW ④ , push SW ③ . This operation is performed twice.

(9) In the case of a left edge adjust, carry it out along (11)

"Technical Left edge pos. Adjust 0" and a printed place.

(10) Perform the adjustment of the right edge position at

"Technical Right edge pos. Adjust 0" and a printed place.

(11) A compensation value is chosen SW ① . (or While pushing SW ④ , push SW ① .)

· The amount of change, please look at the Table 6.6.

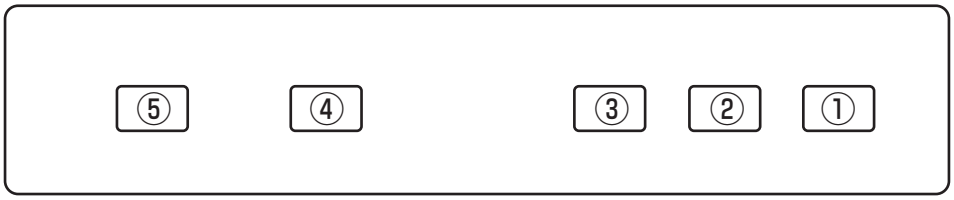
(12) If a target setting value is reached, push SW ⑤ and it is made to complete.

Table 6.6 Left edge and right edge location correction

Menu set	Direction	Quantity of movement (mm)
Right30	Right	4.23
Right29	↑	4.09
Right28		3.95
Right27		3.81
Right26		3.67
⋮		*Each 1/180 inches are increased
Right5		0.71
Right4		0.56
Right3		0.42
Right2	↓	0.28
Right1	Right	0.14
0		
Left1	Left	0.14
Left2	↑	0.28
Left3		0.42
Left4		0.56
Left5		0.71
⋮		*Each 1/180 inches are increased
Left26		3.67
Left27		3.81
Left28		3.95
Left29	↓	4.09
Left30	Left	4.23

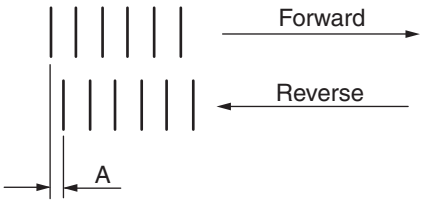
6.7 Print Registration Adjust

It is the number of the switch to use for explanation.



Specification

Speed Mode	Menu name	A (mm) or less
Normal Speed	Print Registration 1	±0.10
High Speed	Print Registration 2	±0.15
Draft Speed	Print Registration 3	±0.15
HSD Speed	Print Registration 4	±0.20



Adjusting Method

(1) Turn on power while holding SW ① and SW ② .

(2) While pushing SW ① , push SW ② .

(3) Cut paper (1P 55kg paper) is set. or continuation paper is set.

· Menu mode is started by setting a paper.

(4) While pushing SW ④ , push SW ③ . This operation is performed four times.

· Print it **"Set-Up"**

(5) In the case of a normal speed, push SW ② three times.

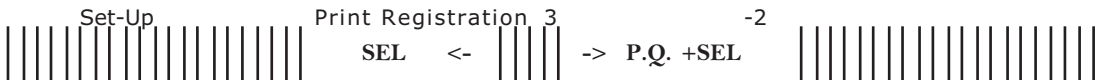
· Print it **" Set-Up Print Registration 1 0 "**

In the case of a high speed, push SW ② four times.

· Print it **" Set-Up Print Registration 2 0 "**

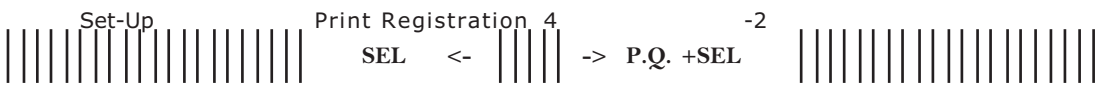
In the case of a Draft speed, push SW ② five times.

· Print it **" Set-Up Print Registration 3 0 "**



In the case of a HSD speed, push SW ② six times.

· Print it **" Set-Up Print Registration 4 0 "**



(9) When coordinate the registration with each mode, push a SW ① .

(or While pushing SW ④ , push SW ① .)

· The amount of change, please look at the Tabel6.7.

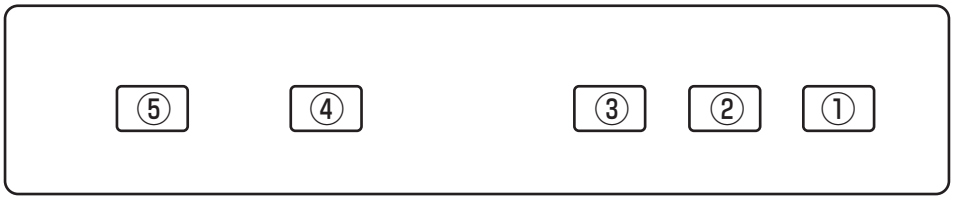
(10) If a target setting value is reached, push SW ⑤ and it is made to complete.

Table 6.7 Print Registration Adjust

Preset	Correction
+10	Move 0.35 mm to the right from the reference position.
+9	Move 0.315 mm to the right from the reference position.
+8	Move 0.28 mm to the right from the reference position.
+7	Move 0.245 mm to the right from the reference position.
+6	Move 0.21 mm to the right from the reference position.
+5	Move 0.175 mm to the right from the reference position.
+4	Move 0.14 mm to the right from the reference position.
+3	Move 0.105 mm to the right from the reference position.
+2	Move 0.07 mm to the right from the reference position.
+1	Move 0.035 mm to the right from the reference position.
0	Reference position
-1	Move 0.035 mm to the left from the reference position.
-2	Move 0.07 mm to the left from the reference position.
-3	Move 0.105 mm to the left from the reference position.
-4	Move 0.14 mm to the left from the reference position.
-5	Move 0.175 mm to the left from the reference position.
-6	Move 0.21 mm to the left from the reference position.
-7	Move 0.245 mm to the left from the reference position.
-8	Move 0.28 mm to the left from the reference position.
-9	Move 0.28 mm to the left from the reference position.
-10	Move 0.35 mm to the left from the reference position.

6.8 Check the Serial Number

It is the number of the switch to use for explanation.



Check the serial number of the printer unit written to the control board in 5.2.3.

The procedure to check the serial number is described below.

(1) Turn the printer off.

(2) Press and hold down the SW ① and SW ② at the same time while turning the printer on. The SEL light will flash.

(3) Press and hold down the SW ① and then press the SW ② .

(4) Check the printed menu in the following format for the serial number of the printer unit written to the control board.

<Print format sample>

ML895FP EIO X F/W XX.XX.XX 45449501YR-XX
LD XX.XX
S/N : AL12345678 ← **Check the serial number here.**
Menu Print? (Configuration #1)
⋮

(5) Check to make sure that the serial number printed in (4) and the one labeled on the printer unit are the same. If the serial number is not printed or the serial numbers do not match, write the serial number to the control board again using a serial number writing tool.

7. MAINTENANCE TEST

7.1 Selecting the Test Mode

The switches on the operator panel have the functions indicated in Table 7-1 so that various tests can be conducted for maintenance.
To start the test in Table 7-1, turn power ON while pressing the switch marked with the ○.
In maintenance mode 1, maintenance mode 2, or print test selection mode test, start the test in Table 7-2 by pressing the switch marked with the ○ while at the same time holding down the switch marked with the ●.

It is the number of the switch to use for explanation.

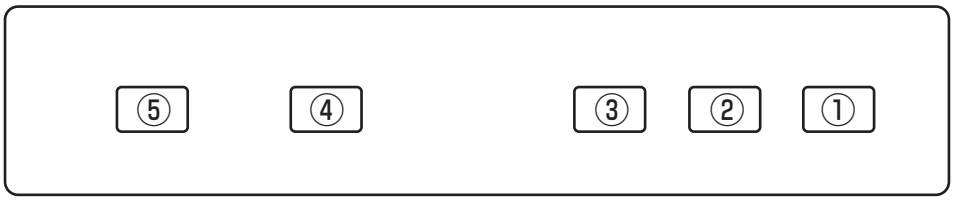


Table 7-1: Function (1/2)

Switch Number	Print Mode		Hex Dump Mode		Menu Mode	Test Mode	Power On Mode
	Select	Deselect	Select	Deselect			
SW ①	Sets Printer off line.	Sets Printer on line.	Sets Printer off line.	Sets Printer on line.	Increments a setting in SET.	Suspends test printing temporarily.	
SW ②	Performs one line feed. Perform form feed when pressed over 500ms.	Performs one line feed. Perform form feed when pressed over 500ms.	Performs one line feed. Perform form feed when pressed over 500ms.	Paper Loaded --> Performs form feed for continuous forms, and paper ejection for cut sheets.	Increments an item in ITEM.		
SW ③	No Paper Loaded --> Performs paper feed. Paper Loaded --> Continuous Forms: Feeds to the position of the paper cut point or the paper printing point. Cut Sheets: Ejects paper.	No Paper Loaded --> Performs paper feed. Paper Loaded --> Continuous Forms: leaves paper. Cut Sheets: Ejects paper.	No Paper Loaded --> Performs paper feed. Paper Loaded --> Continuous Forms: Feeds to the position of the paper cut point or the paper printing point. Cut Sheets: Ejects paper.	No Paper Loaded --> Performs paper feed. Paper Loaded --> Continuous Forms: leaves paper. Cut Sheets: Ejects paper.	Increments a group in GROUP.		
SW ④	Select Print Mode	Select Print Mode					
SW ⑤	Select Character Pitch	Select Character Pitch			Ends Menu mode.		
SW ① + SW ②	Select Media Type	Select Media Type					Sets Maintenance mode 1
SW ① + SW ③		Select eject direction for cut sheet. *1					
SW ③ + SW ①	Performs a fine line feed of 1/180 inches (reverse) only at cut position adjustment.	Performs a fine line feed of 1/180 inches (reverse) only at paper load position adjustment.					Activate User Menu mode.

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Table 7-1: Function (2/2)

Switch Number	Print Mode		Hex Dump Mode		Menu Mode	Test Mode	Power On Mode
	Select	Deselect	Select	Deselect			
SW ③ + SW ②	Performs a fine line feed of 1/180 inches (forward) only at cut position adjustment.	Performs a fine line feed of 1/180 inches (forward) only at paper load position adjustment					Sets Maintenance mode 2
SW ③ + SW ⑤							Turning Operator Panel SW Lockout mode On and Off.
SW ④ + SW ①		Reset the printer condition.			Decrements an item in SET.		
SW ④ + SW ②					Decrements an item in ITEM.		
SW ④ + SW ③					Decrements a group in GROUP.		
SW ④ + SW ⑤					Prints all items		Select the kind of the return value of iSerial Number for USB. (Switching return of which production serial No. or fix value.)
SW ⑤ + SW ④	Select Print Speed	Select Print Speed					
SW ① + SW ② + SW ③							Sets Maintenance mode 3
SW ② + SW ③ + SW ④							Sets Maintenance mode 4
SW ② + SW ④ + SW ⑤							AOS mode default set. *2
SW ③ + SW ④ + SW ⑤							THAI mode default set. *2

Store the printer with SW ① + SW ③, SW ⑤ + SW ④, SW ④ and SW ⑤ condition permanently after change.
*1: In the case of the paper type lever is set to the side of the cut sheet paper and the Output switchover lever is set to the side of Top out, this mode is supported.
*2: only support for Asia and Oceania Model.

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Table 7-2

[Maintenance Mode 1]

Switches					Printer operations
SW ⑤	SW ④	SW ③	SW ②	SW ①	
			○	●	Activate Menu mode. (without Technical Group)
		○		●	Activate Hex Dump mode.
			●	○	Activate Rolling ASCII printing mode.
		○	●		Activate Demo pattern printing mode.
	●			○	User menu and Technical menu default setting function. (for Menu configuration 1)
	●		○		User menu and Technical menu default setting function. (for Menu configuration 2)
	●	○			The default setting function of the paper cut position, paper loading position and the user adjusting values.
●	○				Rolling ASCII Test (9.4 inch width)

● : Holding down the relevant switch and press the switch marked with ○

○ : Press the relevant switch

[Maintenance Mode 2]

Switches					Printer operations
SW ⑤	SW ④	SW ③	SW ②	SW ①	
			○	●	Activate Technical Menu mode.
	○			●	Activate adjustment menu mode.
○				●	Sensor condition display on LED.
		●		○	Activate ECMA pattern printing mode.
●				○	Performs printer usage log printing.
●		○			Registering Sensor Level (Registers all sensors)

● : Holding down the relevant switch and press the switch marked with ○

○ : Press the relevant switch

[Maintenance Mode 3]

Switches					Printer operations
SW ⑤	SW ④	SW ③	SW ②	SW ①	
		○		●	Restores the menu settings to program ROM defaults.
			●	○	Printing of the adjusted value for the printer's setting.
	○	●			Registering mode of Skew Sensor setting position (After this registration, the registered value is printed.)
○		●			Registering Sensor Level (Registers all sensors) + (Printing for the result of the setting)
●				○	Registering Sensor Level (Registers wide sensor)
	●			○	Mode of original point setting mode
●			○		Registering Sensor Level (Registers table sensor)
●		○			Registering Sensor Level (Registers skew sensor)

● : Holding down the relevant switch and press the switch marked with ○

○ : Press the relevant switch

[Maintenance Mode 4]

Switches					Printer operations
SW ⑤	SW ④	SW ③	SW ②	SW ①	
			○	●	Activate firmware update function.

● : Holding down the relevant switch and press the switch marked with ○

○ : Press the relevant switch

Caution:

1. Hexadecimal dump is a mode in which all data sent from the host computer to the printer are printed in hexadecimal.
2. With [function setup menu default setting] items excluding the mechanism correction value will return to default.

7.2 Setting the Menu

7.2.1 Items in the User Menu

MODEL1:North and South America Model
MODEL2:Europe Model
MODEL3:Asia and Oceania Model
*:Factory default
--:Items not supported

GROUP	ITEM	FUNCTION	SETS	MODEL		
				1	2	3
Printer Control	Emulation Mode	Select emulation mode.	EPSON LQ IBM PPR IBM AGM Olivetti IBM 4722	*	*	*
Font	Print Mode	Select quality of ANK characters.	Draft LQ Courier LQ Roman LQ Swiss LQ Swiss Bold LQ Orator LQ Gothic LQ Prestige LQ OCR-A LQ OCR-B HSD	*	*	*
	Pitch	Select character pitch.	10CPI 12CPI 15CPI 17.1CPI 20CPI	*	*	*
	Proportional Spacing	Select whether to use proportional spacing or not.	No Yes	*	*	*
	Style	Select either font style.	Normal Italics	*	*	*
Font (Continue)	Size	Select the character scale size. Selects both double width and double height character or single width and single height characters.	Single Double	*	*	*

GROUP	ITEM	FUNCTION	SETS	MODEL		
				1	2	3
Symbol Sets	Character Set	Select character code table.	Set I	*		*
			Set II		*	
			T1P	-	-	
			ITP	-	-	
	Language Set	Select a language character set.	American/ASCII	*	*	*
			French			
			German			
			British			
			Danish I			
			Swedish/Swedish I			
			Italian			
			Spanish I			
			Japanese			
			Norwegian			
			Danish II			
			Spanish II			
			Latin American			
			French Canadian			
			Dutch			
			Swedish II	-		-
			Swedish III	-		-
			Swedish IV	-		-
			Turkish	-		-
			Swiss I	-		-
			Swiss II	-		-
			Publisher			
	Zero Character	Select either print font pattern to receive a zero character located at 30H in ANK code.	Unslashed		*	
			Slashed	*		*

GROUP	ITEM	FUNCTION	SETS	MODEL		
				1	2	3
Symbol Sets (Continue)	Code Page	Select a code page.	USA Canada French Multilingual Portugal Norway Turkey Greek_437 Greek_869 Greek_928 Greek_437 CYPRUS Polska Mazovia Serbo Croatic I Serbo Croatic II ECMA-94 Hungarian CWI Windows Greek Windows East Europe Windows Cyrillic East Europe Latin II - 852 Cyrillic I - 855 Cyrillic II - 866 Kamenicky (MJK) ISO Latin 2 Hebrew NC (862) Hebrew OC Turkey_857 Latin 5 (Windows Turkey) Windows Hebrew Ukrainian Bulgarian ISO Latin 6 (8859/10) Windows Baltic Baltic_774 KBL-Lithuanian Cyrillic Latvian Roman-8 Icelandic-861 Multilingual 858 ISO 8859-15 Greek_737 Asmo 449+ Asmo 708 Arabic 864 Windows Arabic POL 1 Macedonian BRASCII Abicomp THAI-C THAI-KU TIS988 -2533 THAI-ISO1 THAI-ISO2 THAI-SIC THAI-TN	*	*	*

GROUP	ITEM	FUNCTION	SETS	MODEL		
				1	2	3
Symbol Sets (Continue)	Slashed Letter O	Set whether to convert slashed 0 located at 9BH and 9DH in USA code page or not.	No Yes	- -	* 	- -
	ITP Mode	Select the Thai character printing method.	Normal Special	- -	- -	*
	Select Thai Code Page ID	Select the Code Page ID number of function.	New Old	- -	- -	 *
Front Feed	Line Spacing	Select line feed pitch.	6 LPI 8 LPI	* 	* 	*
	Form Tear-off	When printer is idle (0.5, 1.0 or 2.0 sec), paper is advanced from the current print position to the tear position. When data is received, paper is moved to its original printing position.	Manual 0.5 sec 1.0 sec 2.0 sec	*	*	*
	Skip Over Perforation	Select whether to skip over perforation or not.	No 25.4 mm (1")	* 	* 	*
	Page Width	Change to more than 8" to print on narrow paper.	8" Expand	* 	* 	*
	Page Length	Select the length of a continuous form.	279.4 mm (11") 296.3 mm (11 2/3") 304.8 mm (12") 355.6 mm (14") 431.8 mm (17") 76.2 mm (3") 82.6 mm (3.25") 84.7 mm (10/3") 88.9 mm (3.5") 93.1 mm (11/3") 101.6 mm (4") 127.0 mm (5") 139.7 mm (5.5") 152.4 mm (6") 177.8 mm (7") 203.2 mm (8") 215.9 mm (8.5")	* 	 * 	*
	Initial Position	Select the vertical print position when printer is turned on.	Print Position Cut Position	* 	* 	*
	Cut Position Adjust	Select an adjustment value for the position to cut the end of a continuous form.	-30~-1 0 +1~+30	* 	* 	*
	TOF Adjust	Select an adjustment value for the reference position in regard to the TOF position of a continuous form. The position moves to the rear of the form by (+) and to the top of the form by (-) in 1/180 in increments.	-30~-1 0 +1~+30	* 	* 	*

GROUP	ITEM	FUNCTION	SETS	MODEL		
				1	2	3
Front Feed (Continue)	Top of Form	Select an adjustment value for the reference position in regard to the Top of Form of a continuous form.	2.12 mm (1/12") 4.23 mm (2/12") 6.35 mm (3/12") 8.47 mm (4/12") 10.58 mm (5/12") 12.70 mm (6/12") 14.82 mm (7/12") 16.93 mm (8/12") 19.05 mm (9/12") 21.17 mm (10/12") 23.28 mm (11/12") 25.40 mm (12/12") 27.52 mm (13/12") User top of form	*	*	*
	Auto Eject Position	Select a printable area at the bottom of continuous form. (the character center position.)	6.35 mm 12.70 mm 14.82 mm 4.8 mm	*	*	*
	LF Revise	Adjust the line feed amount.	-2 -1 0 1 2	*	*	*
	Fanfold Mode Select	In the case of the moving tractor, Setting of the mode that is the position of the printing start position whether is moved as same as the tractor moving.	Tractor Fixed Set Free Auto switch Set Free	*	*	*
	Extend Left Print Area	Expanding the printable area to left side for the continuous form in increments of one charactor (per 2.54mm) to 4 charactors (10cpi).	Invalid 2.54mm 5.08mm 7.62mm 10.16mm	*	*	*
	Left Margin	Sets continuous paper left margin blank space.	1 mm 3 mm 5.08 mm 10 mm 13 mm 15 mm 20 mm 25 mm	*	*	*
	Left Margin Adjust	Micro-adjustment of left margin blank space in continuous paper mode using 1/180 inch units.	Left30 ~ Left 1 0 Right 1 ~ Right30	*	*	*
	Right Margin	Sets continuous paper right margin blank space.	Right Margin Over 1 mm 3 mm 5.08 mm 10 mm 13 mm 15 mm 20 mm 25 mm	*	*	*

GROUP	ITEM	FUNCTION	SETS	MODEL		
				1	2	3
Cut Sheet	Line Spacing	Select line feed pitch.	6 LPI	*	*	*
			8 LPI			
	Page Width	Change to more than 8" to print on narrow paper.	8"			
			8.1"			
			8.8"			
			9"			
			9.4"	*	*	*
Cut Sheet (Continue)	Page Length	Select the page length of cut sheet.	279.4 mm (11")	*		
			296.3 mm (11 2/3")		*	*
			304.8 mm (12")			
			355.6 mm (14")			
			420.9 mm (16.57”)	-		-
			431.8 mm (17")		-	
			76.2 mm (3")			
			82.6 mm (3.25")			
			84.7 mm (10/3")			
			88.9 mm (3.5")			
			93.1 mm (11/3")			
			101.6 mm (4")			
			127.0 mm (5")			
			139.7 mm (5.5")			
			152.4 mm (6")			
			177.8 mm (7")			
			203.2 mm (8")			
			215.9 mm (8.5")			
	Page Length (Passbook)	Select the page length of cut sheet.(Passbook)	62 mm			
			64 mm			
			66 mm			
			68 mm			
			70 mm			
			72 mm			
			74 mm			
			76 mm			
			78 mm			
			80 mm			
			82 mm			
			84 mm			
			86 mm	*	*	*
			88 mm			
			90 mm			
			92 mm			
			94 mm			
			96 mm			
			98 mm			
			100 mm			
			110 mm			
			120 mm			
			130 mm			
			140 mm			
			150 mm			
			160 mm			
			170 mm			
	Wait Time	Select the waiting time between setting paper on the tray and feeding it while the printer is waiting for paper to be fed in cut sheet manual feed mode.	Invalid			
			0.5 sec	*	*	*
			1.0 sec			
			1.5 sec			
			2.0 sec			
			3.0 sec			

GROUP	ITEM	FUNCTION	SETS	MODEL		
				1	2	3
Cut Sheet (Continue)	Auto Eject Position	Select a printable area at the bottom of cut sheet paper in cut sheet mode (the character centre position).	6.35 mm 12.70 mm 14.82 mm 4.8 mm	*	*	*
	TOF Adjust	Select an adjustment value for the reference position in regard to the TOF position of cut sheet paper. The position moves to the rear of the form by (+) and to the top of the form by (-) in 1/180 in increments.	-30~-1 0 +1~+30	*	*	*
	Top of Form	Select the reference position for the TOF position when feeding cut sheet. (Up to the midsection of characters in the first line.)	2.12 mm (1/12") 4.23 mm (2/12") 6.35 mm (3/12") 8.47 mm (4/12") 10.58 mm (5/12") 12.70 mm (6/12") 14.82 mm (7/12") 16.93 mm (8/12") 19.05 mm (9/12") 21.17 mm (10/12") 23.28 mm (11/12") 25.40 mm (12/12") 27.52 mm (13/12") User top of form	*	*	*
	LF Revise	Adjust a line feed amount in the cut sheet mode.	-14~-1 0 +1~+14	*	*	*
	Eject Direction	Select the eject direction.	Front Top	*	*	*
	Left Margin (Cut Sheet)	Sets cut sheet left margin blank space.	1 mm 3 mm 5.08 mm 10 mm 13 mm 15 mm 20 mm 25 mm	*	*	*
	Left Margin Adjust (Cut Sheet)	Adjusts printing initialization position by units of 1/180 inch.	Left 30 ~ Left 1 0 Right 1 ~ Right 30	*	*	*
	Right Margin (Cut Sheet)	Sets cut sheet right margin blank space.	Right Margin Over 1 mm 2 mm 3 mm 4 mm 5 mm 6 mm	*	*	*
	Fanfold Paper Detection	Checks for printing data exceeding printing paper on right side.	Paper Width Sprocket Hole Fanfold Paper Cut Sheet	*	*	*

GROUP	ITEM	FUNCTION	SETS	MODEL		
				1	2	3
Cut Sheet (Continue)	Left Margin (Fanfold)	Sets cut sheet left margin blank space.(Fanfold)	1 mm 3 mm 5.08 mm 10 mm 13 mm 15 mm 20 mm 25 mm	*	*	*
	Left Margin Adjust (Fanfold)	Adjusts printing initialization position by units of 1/180 inch. (Fanfold)	Left 30 ~ Left 1 0 Right 1 ~ Right 30	*	*	*
	Right Margin (Fanfold)	Sets cut sheet right margin blank space.(Fanfold)	Right Margin Over 1 mm 3 mm 5.08 mm 10 mm 13 mm 15 mm 20 mm 25 mm	*	*	*
	Printer Priority	Can select priority of print speed or print quality.	Quality Speed Best Speed	*	*	*
Set-Up	Graphics	Select the printing direction when double-height print data exists in a line.	Bi-directional Uni-directional	*	*	*
	Receive Buffer Size	Select size of the received buffer. When “1 Line” is selected, the receive buffer size is set to 2 k bytes.	1Line 32 K 64 K 128 K	*	*	*
	Paper End Detection	Select whether to detect paper end or not. Change to OFF to override the sensor and print closer to the bottom of the page.	Off On	*	*	*
	Print Registration 1	Adjust the print starting position on printing in the reverse direction. (The position moves to the right or left in 1/720 in increments.)	-10~-1 0 +1~+10	*	*	*
	Print Registration 2	Adjust the print starting position on printing in the reverse direction. (The position moves to the right or left in 1/720 in increments.)	-10~-1 0 +1~+10	*	*	*
	Print Registration 3	Adjust the print starting position on printing in the reverse direction. (The position moves to the right or left in 1/720 in increments.)	-10~-1 0 +1~+10	*	*	*
	Print Registration 4	Adjust the print starting position on printing in the reverse direction. (The position moves to the right or left in 1/720 in increments.)	-10~-1 0 +1~+10	*	*	*
	Operator Panel Function	Select full or limited operation.	Full Operation Limited Operation	*	*	*

GROUP	ITEM	FUNCTION	SETS	MODEL		
				1	2	3
Set-Up	Reset Inhibit	Changing this to Yes prevents a reset signal from the computer from resetting the printer to its defaults.	No Yes	*	*	*
	Print Suppress Effective	Select whether to enable or disable a print suppress setup command.	No Yes	*	*	*
Set-Up (Continue)	Auto LF	Select whether to perform auto LF operation or not upon receiving a CR code. If your print out is consistently double spaced, select No, if it overprints, select Yes.	No Yes	*	*	*
	Auto CR (Displayed only for IBM emulation)	Select Yes to add a carriage return when a Line Feed is received at the end of a line.	No Yes	*	*	*
	SI Select Pitch (10CPI) (Displayed only for IBM emulation)	Select how to handle an SI command received in 10CPI mode.	15CPI 17.1CPI	*	*	*
	SI Select Pitch (12CPI) (Displayed only for IBM emulation)	Select how to handle an SI command received in 12CPI mode.	12CPI 20CPI	*	*	*
	Time Out Print	Select valid or invalid.	Valid Invalid	*	*	*
	Auto Select	Determines whether or not the printer will automatically be selected after you load in paper. Select No if you want to set the Top of Form position.	No Yes	*	*	*
	Host Interface	Selects which interface the printer uses to receive printing commands.	Auto Interface Parallel USB Serial (Standard) Optional	*	*	*
	Optional Interface	Select whether or not to use the optional interface. If you are using a internal serial I/F, set to 'Disable'.	Enable Disable	*	*	*
	I/F Time Out	Sets the length of time before the interface switches to idle status when no printing commands have been received.	15 sec 30 sec 45 sec 1 min 2 min 3 min 4 min 5 min 0.5 sec 1 sec 2 sec 3 sec 4 sec	*	*	*
	ESC SI Pitch (Displayed only for IBM emulation)	Sets the character pitch used when the ESC SI command is received.	17.1CPI 20CPI	*	*	*

GROUP	ITEM	FUNCTION	SETS	MODEL		
				1	2	3
Set-Up (Continue)	Select Language Set (Displayed only for EPSON emulation)	Changing the language set replaces certain standard symbols with special characters used in foreign languages.	Combined Code Page Only	*	*	*
	Print Style	Select the printer impact mode.	Normal Quiet High Copy	*	*	*
	Select Quiet Mode	Select Quiet print mode.	Mode1 Mode2	*	*	*
	Select High Copy Level	Selection of the High Copy Level.	Level1 Level2 Level3 Level4	*	*	*
	Select High Copy Mode	Selection of the printing mode in the case of set 'Level4' in the 'High Copy Level'.	Mode1 Mode2 Mode3 Mode4	*	*	*
	Reverse Feed Control	In reverse feed the paper is reverse fed back to the original printing position.	TOF stop TOF over	*	*	*
	Print Direction at DH Mode	Select the print direction at the double height printed.	Bi-directional Uni-directional	*	*	*
	Sleep Time	Set idle time to enter sleep mode.	5 min 10 min 15 min 30 min 60 min	*	*	*
	Pin Control	Select whether to have or not have print control during line printing.	Standard Special	*	*	*
	Paper End	Select when to detect Paper End.	On-Line Off-Line	*	*	*
	FF Function	Set feeding operation upon receiving an FF code after cut paper is fed.	Eject Form Feed	*	*	*
	Advanced Paper Eject	Selection of whether performing the 'receiving and deleting' for the LF command (LF, ESC J, ESC j) before the performance of the ejecting command.	Enable Disable	*	*	*
	Print Direction Command	Select the validity of a one-way print setup commnad.	Invalid Valid	*	*	*
	Print Speed Command	Select the validity of a print speed setup command.	Invalid Valid	*	*	*
	Page Length Command	Select the validity of a page length command.	Invalid Valid	*	*	*
	LF Pitch Command	Select the validity of a linefeed pitch command.	Invalid Valid	*	*	*
	Font Command	Select the validity of a font command.	Invalid Valid	*	*	*

GROUP	ITEM	FUNCTION	SETS	MODEL		
				1	2	3
Set-Up (Continue)	Pitch Command	Select the validity of a character pitch command.	Invalid Valid	* *	* *	* *
	Space Adjustment	Select the control of Space Adjustment.	None 1 Blank 2 Blanks 3 Blanks	- - - -	- - - -	*
	Media Type	Selects the cut sheet paper type.	Normal Thin Paper Passbook Thick Passbook	*	*	*
	Compensation broken pin	Selects whether the designated pin correction is on or off and sets the pin break position. * Broken pin override mode is activated as soon as just one pin is broken. Broken pin override is an emergency function and if your printer pin breaks, please contact your local sales agent or authorized repair shop.	Invalid 1Pin ~ 24Pin	*	*	*
Parallel I/F	I-Prime	Select whether to print or clear buffer contents upon initialisation by receiving I-PRIME.	Invalid Buffer Print Buffer Clear	*	*	*
	Auto Feed XT (Displayed only for EPSON emulation)	Select the validity of an Auto Feed XT signal.	Invalid Valid	*	*	*
	Bi-Direction	Set whether to return a device ID or not in accordance with IEEE1284.	Disable Enable	*	*	*
Serial I/F	Parity	None: Absence of parity bit Odd: Odd parity Even: Even parity Ignore: Do not convert the character to 0x40 in case of parity error.	None Odd Even Ignore	*	*	*
	Serial Data 7/8 Bits	Select Serial bit.	8 bit 7 bit	*	*	*
	Protocol	Select an I/F Busy control method.	Ready/Busy X-ON / X-OFF Ready/Busy & X-ON / X-OFF	*	*	*
	Diagnostic Test	Select to perform input/output diagnosis of RS-232C interface signals.	No Yes	*	*	*
	Busy Line	Select to set the Busy Line. “SSD+” and “SSD-” are enabled when using an external RS232C board.	SSD+ SSD- DTR RTS	*	*	*

GROUP	ITEM	FUNCTION	SETS	MODEL		
				1	2	3
Serial I/F (Continue)	Baud Rate	Select to set the Baud Rate.	9,600 bps 4,800 bps 2,400 bps 1,200 bps 600 bps 300 bps 19,200 bps	*	*	*
	DSR Signal	Select the DSR Signal.	Invalid Valid	*	*	*
	DCD Signal	Select the DCD Signal.	Invalid Valid	*	*	*
	DTR Signal	Select a method to switch a DTR signal of a serial interface.	Ready on Power UP Ready on Select	*	*	*
	Busy Time	Select the minimum time between BUSY to READY.	0.2 sec 1.0 sec	*	*	*
	Stop Bit	Select the stop bit.	1 bit 2 bit	*	*	*
	Receive Error	Select the receive error.	Unchecked Checked	* 	* 	*
	IBM Financial (Displayed only for IBM 4722 emulation)	Configuring IBM 4722 financial protocol.	Honor CTS Ignore CTS	*	*	*
Extension	Feed Up when Menu Printing	Setting whether to perform the feeding for to easily visualize.	No Yes	 *	 *	 *
	Menu Print During Cover Open	Setting whether to print in the case of the cover opens.	Disable Enable	 *	 *	 *
	Skew Correction	Setting invalidate or validate for the skew correction.	Valid Invalid	*	*	*
	9pin Emulation Mode	Setting invalidate or validate for 9pin Printer Emulation Mode.	Invalid Valid	*	*	*

7.2.2 Items in the Technical Menu

* Factory default

Group	Item	Setting	Function
Technical	CPU Compensation	Standard * Special1 Special2	Setting the timing of ACK-BUSY signal.
	IF Timing Set	New Old Special *	Setting the timing of STB-BUSY signal. New : to BUSY High with data latch in STB falling Old : to BUSY High with data latch in STB rising Special : to BUSY High in STB falling and data latch in STB raising
	Sleep Mode	Disable Enable *	Setting of 'Disable' or 'Enable' for the Sleep Mode.
	Print Mode Command 4722 Like	No Yes *	Selection of Print Mode command(ESC I) in IBM 4722 emulation. No: Follow the specification of IBM PPR emulation. Yes: Follow the specification of IBM 4722 emulation.
	First dot 4722 Like	No Yes *	Selection of first dot position in IBM 4722 emulation. No: following by the setting of menu. Yes: setting the first dot position the characteristic of IBM 4722 emulation.
	SP check	Valid * Invalid	Selection of validate or invalidate for the function of head original position check. Valid : performance the position check at prescribed intervals for feeding Invalid : not performance the position check

* Factory default

Group	Item	Setting	Function
Technical	Position Check	Check1 * Check2 Check3	Selection of the condition of the Head original point checking. Check1 : default setting · Performance of homing at the timing of the status switching from 'OFFLINE' to 'ONLINE' by the pressing the SW. · Performance of homing at the waking up from power save mode. · Performance of homing at the cover closing. Check2 : extended setting · Performance of the default setting and the following checking function. · Performance of homing after the finish of the function of exiting and evacuating. Check3 : extended setting 2 · Performance of the extended setting and the following checking function. · Performance of homing after the function of feeding (after the function of the sensing of the paper width).
	Image Print Control	High Speed Mode * High Quality Mode1 High Quality Mode2	Selection for the speed of the image printing. High Speed Mode: 100% printing speed 80% printing speed in the case of including the continuous column printing. High Quality Mode1: 80% printing speed High Quality Mode2: 64% printing speed
	Tear Mode	Tear Up FF + Tear Up* TOF + Tear Up	Selection for the condition and function in Tear Up. Tear Up:Tear Up performed in current position. FF + Tear Up:Tear Up performed inTOF position. In the case of the current vertical control position is not same as TOF position, performance feeding to TOF position and tear up. TOF + Tear Up:In the case of the current vertical control position is same as TOF position, the tear up only performs tear up. In the case of the current vertical control position is not same as TOF position, the non-performance tear up.

* Factory default

Group	Item	Setting	Function
Technical	Serial I/F FIFO Buffer Size	1byte 4byte 8byte * 14byte	Setting of Serial I/F FIFO buffer size.
	LF Switch Function	Unlock Lock *	Setting to invalidate or validate for LF Switch function in the case of set to 'Limited Operation' in 'Operator Panel Function'.
	FF Switch Function	Unlock Lock *	Setting to invalidate or validate for FF Switch function in the case of set to 'Limited Operation' in 'Operator Panel Function'.
	Load Switch Function	Unlock * Lock	Setting to invalidate or validate for Load Switch function in the case of set to Limited Operation' in 'Operator Panel Function'.
	Eject Switch Function	Unlock * Lock	Setting to invalidate or validate for Eject Switch function in the case of set to 'Limited Operation' in 'Operator Panel Function'.
	Tear off Switch Function	Unlock * Lock	Setting to invalidate or validate for Tear off Switch function in the case of set to 'Limited Operation' in 'Operator Panel Function'.
	Character Pitch Switch Function	Unlock Lock *	Setting to invalidate or validate for Character Pitch Switch function in the case of set to 'Limited Operation' in 'Operator Panel Function'.
	Print Mode Switch Function	Unlock Lock *	Setting to invalidate or validate for Print Mode Switch function in the case of set to 'Limited Operation' in 'Operator Panel Function'.
	Reset Switch Function	Unlock Lock *	Setting to invalidate or validate for Reset Switch function in the case of set to 'Limited Operation' in 'Operator Panel Function'.
	Adjust TOF Pos. Switch Function	Unlock Lock *	Setting to invalidate or validate for Adjust TOF Pos. Switch function in the case of set to 'Limited Operation' in 'Operator Panel Function'.
	Adjust Load Pos. Switch Function	Unlock Lock *	Setting to invalidate or validate for Adjust Load Pos. Switch function in the case of set to 'Limited Operation' in 'Operator Panel Function'.
	Adjust Tear Pos. Switch Function	Unlock Lock *	Setting to invalidate or validate for Adjust Tear Pos. Switch function in the case of set to 'Limited Operation' in 'Operator Panel Function'.

* Factory default

Group	Item	Setting	Function
Technical	Print Speed Switch Function	Unlock Lock *	Setting to invalidate or validate for Print Speed Switch function in the case of set to 'Limited Operation' in 'Operator Panel Function'.
	Media Type Switch Function	Unlock Lock *	Setting to invalidate or validate for Media Type Switch function in the case of set to 'Limited Operation' in 'Operator Panel Function'.
	Eject Direction Switch Function	Unlock Lock *	Setting to invalidate or validate for Eject Direction Switch function in the case of set to 'Limited Operation' in 'Operator Panel Function'.
	Buffer Near Full Time	Mode1 * Mode2	Select receive wait time in buffer near full.
	Buffer Near Full Control	Mode1 * Mode2	Select control in buffer near full.
	Paper Edge Sense Range	Limited Range Wide Range *	Select the performance range of paper width sense function in feeding the cut sheet. Limited range: Performance paper width sense function with to conform the paper width. The paper width sense functions from the right end of paper to the sloping part of ribbon protector and as to prevent to run over than paper. Wide range: Performance paper width sense function on maximum range without paper width.

* Factory default

Group	Item	Setting	Function
Technical	Paper Edge Sense Pos. (Cut Sheet)	4.23mm (2/12") 6.35mm (3/12") 8.47mm (4/12") 10.58mm (5/12") 12.7mm (6/12") 14.82mm (7/12") 16.93mm (8/12") 19.05mm (9/12") * 21.17mm (10/12") 23.28mm (11/12") 25.4mm (12/12") 27.52mm (13/12") Selection TOF	Setting of the performance position that is distance from paper top of paper width sensing in the case of the sensing the paper right and left edges by using edge sensors. # In the case of setting to the continuous route or Fanfold Paper Detection set Sprocket Hole, holding to 19.05mm.
	Left Edge Pos. Adjust	Left30~Left 1 0 * Right 1~Right30	Adjusting of error for sensing position of width sensor in paper width sensing functioning. Application to share the continuous form mode and the cut sheet mode in common. Left30 ~ Left1 :adjusting to 30/180 inch ~ 1/180 inch in left. Right1 ~ Right30 : adjusting to 1/180"" ~ 30/180"" in right.
	Right Edge Pos. Adjust	Left30~Left 1 0 * Right 1~Right30	Adjusting of error for sensing position of width sensor in paper width sensing functioning. Application to share the continuous form mode and the cut sheet mode in common. Left30 ~ Left1 :adjusting to 30/180 inch ~ 1/180 inch in left. Right1 ~ Right30: adjusting to 1/180" ~ 30/180" in right.
	Skew Adjust Retry Control	Invalid * Valid	Setting to invalidate or validate for to retry at the skew correction function in the case of the adjustment is 'NG'.

* Factory default

Group	Item	Setting	Function
Technical	Skew Sensitivity	Level 1 Level 2 * Level 3	Setting of severity for the skew check in the using 'Cut paper', 'passbook' and 'thick passbook'. Level1: tight Level2: normal Levle3: loose* * Feed function be executed with some skew.
	Skew Sensitivity (Thin paper)	Level 1 Level 2 Level 3 *	Setting of severity for the skew check in the using 'thin paper'. Level1: tight Level2: normal Levle3: loose* * Feed function be executed with some skew.
	Adjust Skew Mode Position (Base)*	-40 ~ -6 * ~ 0 ~ +14	Adjusting the front roller position for skew correction. * Adjusting the gap between the upper and lower of the front roller to perform optimum skew correction depending on media.
	Adjust Skew Mode Position (Wide)*	-14 ~ -1 0 * +1 ~ +14	Further adjusting the front roller position for a retry of skew correction of wide paper. * Adjusting the gap between the upper and lower of the front roller to perform optimum skew correction depending on media.
	Top Sense Detection (Cut Sheet)	Distance from Shutter Skew Sensor * Paper Edge Sensor	Setting the method of sensing for top of form. · Invalidate in the case of causing skew by performance the TOF sensing. Distance from Shutter: Performing this at a fixed distance from shutter Skew Sensor: Performing TOF by skew sensor. Paper Edge Sensor: sPerforming TOF by page edge sensor. # TOF sensing performs at same position as PE sensor.
	TOF Base Adjust (Front Feed)	-30~-1 0 * +1~+30	Selection the adjusting value of TOF to the continuous form in increments of 1/180 inch.
	TOF Base Adjust (Cut Sheet)	-30~-1 0 * +1~+30	Selection the adjusting value of TOF to the cut sheet in increments of 1/180 inch.

* Factory default

Group	Item	Setting	Function
Technical	Slice Level Adjust(Marker)	x1.25 x1.50 x1.75 x2.00 x2.25 * x2.50 x2.75 x3.00	Setting the scale of sensor slice level compensation (for PR2 Marker Read).
	Left Edge Adjust(Marker)	Left30~Left 1 0 * Right 1 ~ Right30	Adjusting the sensor detection position (for PR2 Marker Read).
	Select Condition after Jam Clear	On-Line Off-Line *	Selection of 'SELECT' or DESELECT' in the case of to deactivate the Jam alarm. On-Line: to SELECT Off-Line: to DESELECT
	Eject Condition	Bottom Detect * FF Code	Selection the ejection condition at Bottom detect in cut sheet manual feeding mode. Bottom Detect: Perform auto ejection in bottom detection. FF code: Ejection by FF code.
	Print Non Guarantee Area	Valid Invalid *	Invalid: The bottom margin of cut paper is set to the margin selected for Auto Eject Position. Valid: The bottom margin of cut paper is set to 2.12mm..
	Slack Adjust (Front Feed)	Valid Invalid *	Setting of whether to performance the slack adjusting control.
	Form Feed Position	Printing Start Position * Clamping	Setting the stop position whether the TOF position or Shutter position in paper feeding after skew correction.
	Clamp after Eject	Mode1 * Mode2	Specification of the front feed roller position in the end of paper exit function. Mode1: The roller pressure be depressed without thick passbook. Mode2: The roller pressure be depressed for all mode.

* Factory default

Group	Item	Setting	Function
Technical	Feed Method (Continuous)	Media out Platen down * SLS Print	Selection of the line feed method for continuous paper mode. Media out: The line feeding be executed with to evacuate the carriage to outside of the media. However, in the case of the evacuation distance can not be keep, the line feeding is executed with to down the platen. Platen down: The line feeding is executed with to down the platen without the paper width. SLS Print: Performing short line seek printing without line feeding with retracting the carriage to outside of the media or lowering the platen.
	Feed Speed(Cut Sheet)	Variable Speed Fix Speed *	Selection of the feed speed and the line feed speed of the LF for the Cut Sheet. Variable Speed: variability Fix Speed: Fix to 6IPS
	Cut Sheet Eject Speed Control	Valid * Invalid	Selection the ejection speed depending on cut sheet ejection distance. Valid: Ejecting at a silent lower speed for the distance less than 4 inch. Invalid: Ejecting at a high speed.
	Cut Sheet Eject Control	Mode1 * Mode2	Selection the cut sheet ejection method. Mode1: Ejecting curled paper by applying an appropriate control. Mode2: Performing ejection giving a priority to the ejecting speed.
	Powon Paper Eject	Valid Invalid *	Selection whether to unconditionally perform paper ejection or not at power on. Valid: Ejecting paper regardless of presence of paper at power on in the cut sheet mode Invalid: Ejecting paper at power on in the cut sheet mode if paper has been fed.
	Centering Action	Valid * Invalid	Selection whether to perform centering before the top end of paper is inserted into the rear feed roller at paper feeding and line feeding (in the Normal mode or Thin Paper mode). Valid: Performing centering Invalid: Not performing centering

* Factory default

Group	Item	Setting	Function
Technical	Centering Action(Passbook)	Valid * Invalid	Selecting whether to perform centering before the top end of paper is inserted into the rear feed roller at paper feeding and line feeding (in the Passbook mode or Thick Passbook mode). Valid : Performing centering Invalid : Not performing centering
	Centering Action(Front Feed)	Valid * Invalid	To decide of the Centering Actin in line feed for the Continuous form mode. Valid: Executing the Centering Action in all sections until the top of the paper is reached to the rear feed roller. Invalid: Executing the Centering Action only when the top of the paper is existent at the section of between the paper guide and the rear roller.
	Power Save SP Homing	Valid * Invalid	Selection whether to perform print head homing at entering the power save mode. Invalid: Not moving the carriage Valid: Moving the carriage close to the home sensor to shorten the SP homing time at exiting the power save mode.
	Passbook Width Detection	Invalid * Valid	Valid : Automatically setting the passbook mode at detecting the width of the passbook. Any width between 110mm and 143mm is recognized as a passbook.
	Receive at Online PE(Cut Sheet)	Enable Disable *	Selection whether to enable of the continuous data receiving without in the state of the paper feeding. Enable: Receiving the data continuously Disable: Exchanging the state to Busy by detecting the data receiving.
	Parallel I/F SEL Signal 1)	Normal * Special	Selection of the function for the SEL signal of the Parallel I/F. Normal: Keeping the Hi-Level. Special: Exchanging by the state of On-Line or OFF-Line.

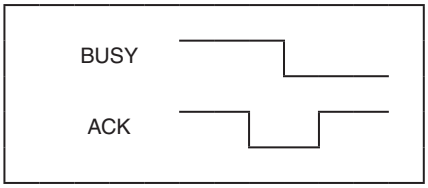
* Factory default

Group	Item	Setting	Function
Technical	Parallel I/F Busy Time	Normal * 200 us 250 us	Selection the BUSY ON duration (from BUSY ON by data reception to OFF).
	Return USB EP2 Descriptor	Disable * Enable	Setting of whether to return the USB EP2 information by the descriptor in initial situation.
	Extended Status	Improve * Compatible	Select whether or not to send in the ASCII code data string that follows after the extension status (EXTSTS). Compatible: as usual, sent in binary code. Improve: Send ASCII code converted to a binary code,in units nibble.
	Serial Number	Disable Enable *	Selection of the kind of the return value for iSerial Number to USB. Disable: return the fixed value Enable: return the product serial number.

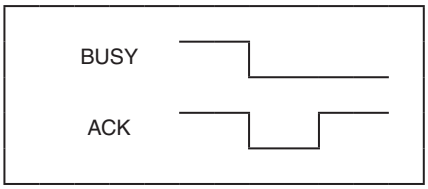
Notes:

1) I/F function is following by the setting vale of 'CPU Compensation'

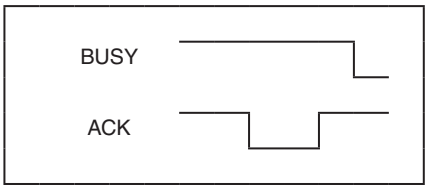
[Standard]



[Special1]

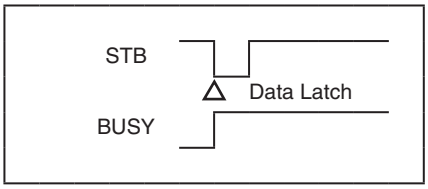


[Special2]

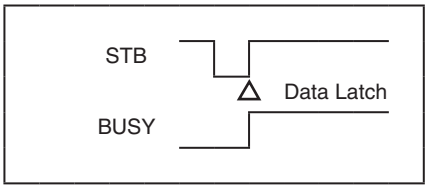


2) I/F function is following by the setting vale of 'IF Timin Set'

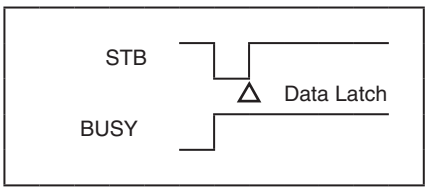
[New]



[Old]

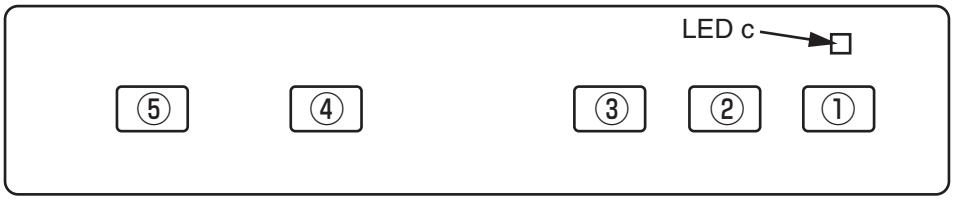


[Special]



7.2.3 Setting the menu

Allocation of switch lamps



1) Overview

Features selected in MENU mode become the default features for the printer each time it is powered on. The Menu function allows the ability to activate features without the use of software commands. Software commands will override MENU settings.

2) Key functions

Key Name	Function
GROUP (SW ③)	General categorization of functions/features. Selects next GROUP title, once through the entire list, loops back to the first GROUP. Also, upon first entering MENU, causes the first line of MENU to be printed.
ITEM (SW ②)	Direct name of functions/features. Selects next ITEM title, once through the entire list, loops back to the first ITEM in the current GROUP. Also, upon first entering MENU, causes the first line of MENU to be printed.
SET (SW ①)	Value (setting) of the ITEM. Selects next SETTING value, once through the entire list, loops back to the beginning of the list. Also, upon first entering MENU, causes the first line of MENU to be printed.
PRINT	Prints entire MENU and loops back to the beginning of MENU.

Note: Pressing these keys while the SW ④ is pressed, selects the items in reverse order.

3) Operation description

(a) User MENU mode:
To enter Menu mode, power ON with to press SW ① + SW ③ switches. Then hold down SW ① switch and press SW ②.

1. printer = deselected state
2. LED c = off

(b) Upon entering Menu mode, press the GROUP key, ITEM key, or SET key to print the first line of MENU. Press the PRINT key to print the whole MENU.

(c) See Key functions above for description of operation within Menu mode.

(d) To exit MENU mode, press the SW ⑤.

(e) If conflicting features/functions are set in menu mode, the printer will treat these function/features according to the priority table.

(f) The TOF position is not affected by MENU mode. (When the page length is changed, be sure to set the TOF.)

(g) To reset menu settings to the factory defaults, perform the following operation.

With the menu configuration 1

a. To enter the maintenance mode 1, power on the printer while holding down the SW ① + SW ② .

b. After it enters the maintenance mode, press the SW ① while holding down the SW ④ .

With the menu configuration 2

a. To enter the maintenance mode 1, power on the printer while holding down the SW ① + SW ②

b. After it enters the maintenance mode, press the SW ② switch while holding down the SW ④ .

8. PROCEDURES FOR REPAIRING

(1) Before repairing

When repair is requested from a customer, confirm whether the problem can be recovered by the methods described in "Measures for Problems" in the Instruction Manual in advance.

If possible, obtain information of how the problem occurred and write it down.

Before applying measures, operate the printer in the same condition as when the problem was generated and check if the problem still occurs. If the problem does not occur, start searching for the problem by performing test prints.

(2) Searching for what caused the problem

As for the method in searching for the cause of a problem, first confirm the alarm display in Table 8-1, check how the problem generated using Table 8-2, and confirm the specific contents of the problem. Next, search for the problem according to the detailed procedures.

Before repairing the problem, please acknowledge the precautions described in Section 5.1.

(3) Lamp display during a problem

When a problem is generated in this printer, the content of the problem is notified by the lamps in the operation unit. The problem is notified by the blinking of Lamp b and Lamp c.

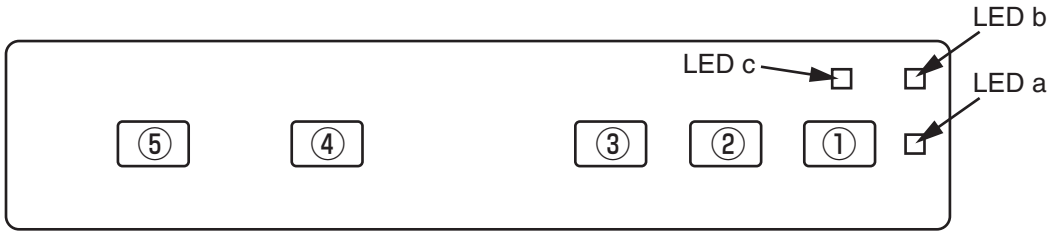
- Display content

Table 8-1

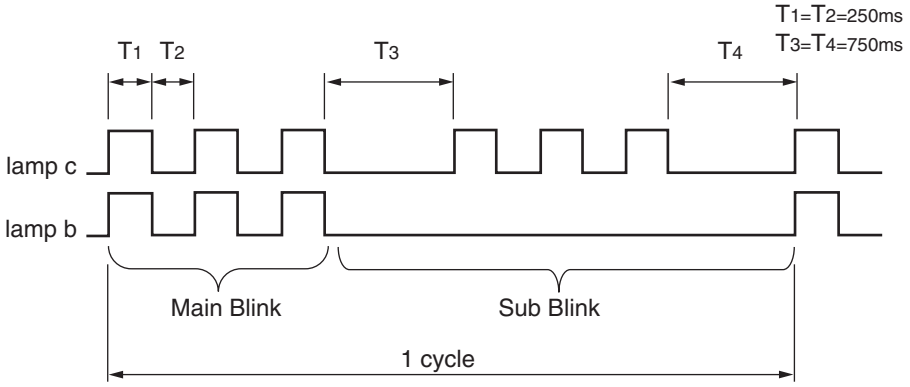
Alarm indication		Alarm details	Cause and Condition
Number of main flashes	Number of sub flashes		
1	1	Print head homing alarm	
	2	Spacing alarm	
	3	Mode Motor alarm	The origin position of the Mode Motor could not been detected.
	7	FAN alarm	
2	1	Program ROM check alarm	· The Hash check in the flash loading. · The Rom check in switching to Power-ON.
	2	CG check alarm	
	3	Flash memory·toggle check error	The toggle function could not been detected in the data writing.
	5	Flash loading·Data writing error	The writing data be in discord with the loading data.
	6	Flash memory·Sector delete error	Already the sector 0 other than had been deleted at the deleting sector 0.
	7	Program ROM unmatch alarm	· The main program had been loaded to flash is not match with hard ware. · The initialization function after the flash loading.
3	2	Flash Memory Polling alarm	
	3	EEPROM alarm (build in print head)	
4	1	CPU internal RAM check alarm.	
	2	CPU alarm (Pre-fetch abort alarm)	
	3	CPU alarm (Data abort alarm)	
	4	LSI alarm (Bus control alarm)	
	5	LSI alarm (DMA translator alarm)	
	6	CPU alarm (Undefined alarm)	
	7	CPU alarm (Watch Dog Timer alarm)	
	9	Interrupt control alarm (happened illegal interrupt)	
5	1	Firmware program alarm	
	2	OS control alarm (data queue full)	
	3	Stack size alarm	

Alarm indication		Alarm details	Cause and Condition
Number of main flashes	Number of sub flashes		
6	1	Paper Edge Sensor alarm	However conducted by the learning function, the detected level is not normal.
	4	Table Sensor short alarm 1	The AD value is lower than the designated value in the GainRange1. Short of on the circuit.
	5	Table Sensor short alarm 2	Connector is not connected, or harness is breaking.
	6	Table Sensor open alarm	The AD value is over than the designated value in the GainRange8. Harness is breaking.
	7	Skew Sensor short alarm 1	The AD value is lower than the designated value in the GainRange1. Short of on the circuit.
	8	Skew Sensor short alarm 2	Connector is not connected, or harness is breaking.
	9	Skew Sensor open alarm	The AD value is over than the designated value in the GainRange8. Harness is breaking.
9	1	Head thermistor alarm (Open status)	The status of the Head thermistor opening has been detected.
	3	Board thermistor alarm	The status of short on the Board thermistor.
	4	Head thermistor alarm (Short circuit status)	The status of short on the Head thermistor.

Allocation of switch lamps



The following describes Main Blink and Sub Blink. (EEPROM alarm)



(4) Items to search

Table 8-2

Fault	Specific Content	Section to Refer
Power source abnormality	There is no response when turning on the power switch. (No lamps illuminate.)	①
Reset circuit abnormality	The carriage does not move at power ON and lamp some illuminates faintly.	②
Operator panel abnormality	Some lamps do not illuminate (although the carriage moves.)	③
	Some lamps illuminate and stay ON.	④
	Some switches do not function or functions continuously.	⑤
Carriage operation abnormality	The carriage does not move at power ON or an alarm generates while printing thus the print job is stopped and an alarm is indicated.	⑥
	The movement of the carriage is abnormal (runs out of control, vibrates, stops during homing, etc.) and an alarm is indicated.	⑦
Paper feed abnormality	Paper-end is generated even when paper is set. (Lamp b goes on.) Paper-end does not generate even in paper-end condition. (Lamp b goes off.)	⑧
	Line is not fed upon receiving/printing data.	⑨
Ink ribbon feed abnormality	Print result is faint. The ink ribbon is not fed properly or is not sent at all.	⑩
Print condition abnormality	Print dots are missing.	⑪
	Space movement is normal but print is not performed.	⑫
Interface abnormality	Upon receiving/printing data: Spacing or printing is not performed and Lamp keeps lluminating.	⑬
	Upon receiving/printing data: Wrong characters are printed. Some characters are missing. Lamp is illuminating.	⑭
<Cut paper Mode> Sensor abnormality (Paper feed error)	The paper feed is possible. However, ALM lamp (LED b) does a blink and does not print.	See the section 2.1.3 and Cleaning the Platen
	Paper is not performed the paper feed.	See the section 2.1.1
	There is exit route movement when turning on the power switch.	
<Continuing paper Mode> Sensor abnormality (Paper feed error)	Paper discharge operation is continued.	

① There is no response when turning on the power switch.
(No lamps light up.)

- Is tIs the AC cable connected correctly?
  - N: Connect the AC cable correctly.
  - Y: Is the cable of CN2 connected to the 200V side of CN3 of a power supply unit?
    - N: The cable of CN2 of a power supply unit is connected to the 200V side of CN3.
    - Y: Is the AC fuse (F1) in the power supply unit burned out?
      - Y: Replace the power supply unit.
      - N: The power cord connected to CN101 is removed from a power supply Unit.
        Is the voltage shown in the table below being output to the connector (CN101) for the power supply unit?

Power supply unit Connector	Pin No.	Voltage
CN101	1 to 3	38 ～ 42V
	4 to 8	0V (GND)
	9 and 10	4.75 ～ 5.25V
	11	ALM-P
	12	POWSAVE-P

        - Y: Replace the Control board
        - N: Measure the resistance between Pin(s) of the following of the POW connector of the Control board. Any Short circuit?

Control board Connector	Measurement Pin of resistance
POW	Pin1(40V) to Pin5(0V)
	Pin9(5V) to Pin5(0V)
	Pin1(40V) to Pin9(5V)

          - Y: Replace the Control board and the power supply unit.
          - N: Replace the power supply unit.

② The carriage does not move at power ON and lamp some illuminates faintly.

- Replace the Control board.

③ Some lamps do not illuminate (although the carriage moves.)

- Replace the Control board or the Operation board.

④ Some lamps illuminate and stay ON.

- Replace the Control board or the Operation board.

⑤ Some switches do not function or functions continuously.

- Replace the Control circuit board or the Operation board.

⑥ The carriage does not move at power ON or an alarm generates while printing thus the print job is stopped and an alarm is indicated.

- Does the carriage move smoothly by hand when the power is turn OFF?
  - N: Does the carriage move smoothly with the ribbon cartridge removed?
    - N: Replace the carriage unit.
    - Y: Replace the ribbon cartridge.
  - Y: Replace the Control board.

⑦ The movement of the carriage is abnormal (runs out of control, vibrates, stops during homing, etc.) and an alarm is indicated.

- Is the SENSOR cord connected, and the attachment of a home position sensor properly?
  - N: Connect the cord or attachment the home position sensor properly.
  - Y: Does the carriage move smoothly when the power is turned OFF?
    - N: Does the carriage move smoothly with the ribbon cartridge removed?
      - N: Replace the carriage unit.
      - Y: Replace the ribbon cartridge.
    - Y: Replace the Control board.

⑧ Paper-end is indicated even when paper is set. (Lamp b lights on.) Or Paper-end does not indicated even in paper-end condition. (Lamp b goes off.)

- After adjusting of the slice level, perform to be feed paper in actuality.
  And turn around the knob of platen or push the switch 3.
  Does the lighting of Lamp b change from on to off?
  - Y: End the procedure.
  - N: Is the connection cord connecting with SKU1 and SKU2 the Skew upper board?
    - N: Connect the cord properly.
    - Y: Is the connection cord connecting with SKU1 and SKU2 the Control board?
      - N: Connect the cord properly.
      - Y: Replace the Skew upper board or the control board.

⑨ Line is not fed upon receiving/printing data.

- Is the LF motor cord connected properly?
  - N: Connect the cord properly.
  - Y: Replace the Control board..

⑩ Print result is faint.
The ink ribbon is not fed properly or is not sent at all.

- Is the ribbon being fed properly during a print job?
  - N: Remove the ribbon cartridge and check if the ribbon feed mechanism is operating properly.
    - N: Replace the ribbon feed gear assembly.
    - Y: Replace the ribbon cartridge.
  - Y: Has the ink ribbon reached its life?
    - Y: Replace the ribbon cartridge.

⑪ Print dots are missing.

- Is the head gap set at the regulated value?
  - N: Readjust the head gap properly.
  - Y: Are dots still missing after replacing the print head?
    - N: End the procedure.
    - Y: Replace the Control board.

⑫ Space movement is normal but print is not performed.

- Is print disabled even after replacing the print head?
  - N: End the procedure.
  - Y: Replace the Control board.

⑬ Upon receiving/printing data:
Spacing or printing is not performed and Lamp keeps lluminating.

- Is the interface cable connected properly?
  - N: Connect the cable properly.
  - Y: Replace the Control board.

⑭ Upon receiving/printing data:
Wrong characters are printed. Some characters are missing. Lamp is illuminating.

- Is the interface cable connected properly?
  - N: Connect the cable properly.
  - Y: Replace the Control board.

9. THEORY OF OPERATION

9.1 Electrical Operation

The electrical operation of the printer circuit is described in this section.

9.1.1 Summary

Figure 9-1 shows the block diagram of the printer.

The control board is made up of the SOC (SYSTEM ON CHIP), peripheral circuits, drive circuits, sensors and interface connectors.

The power to the control board is supplied by the power supply unit through the connector cord.

The power to other electrical parts is also distributed through the connectors within the control board.

9.2 Circuit Operation

9.2.1 SOC and the Peripheral Circuit

(1) SOC

SOC to be CPU and past LSI function, building SRAM into, and the outline of use is as follows.

- 3.3V single power supply (1.2V in internal core voltage)
- Operation frequency 48MHz
- Built-in CPU core (ARM7TDMI)
- SRAM 4M bit
- With built-in USB controller
- With built-in UART function
- AD converter x 4ch DA converter x 2ch

OKI of other peripheral circuitry is original though CPU core uses ARM7TDMI.

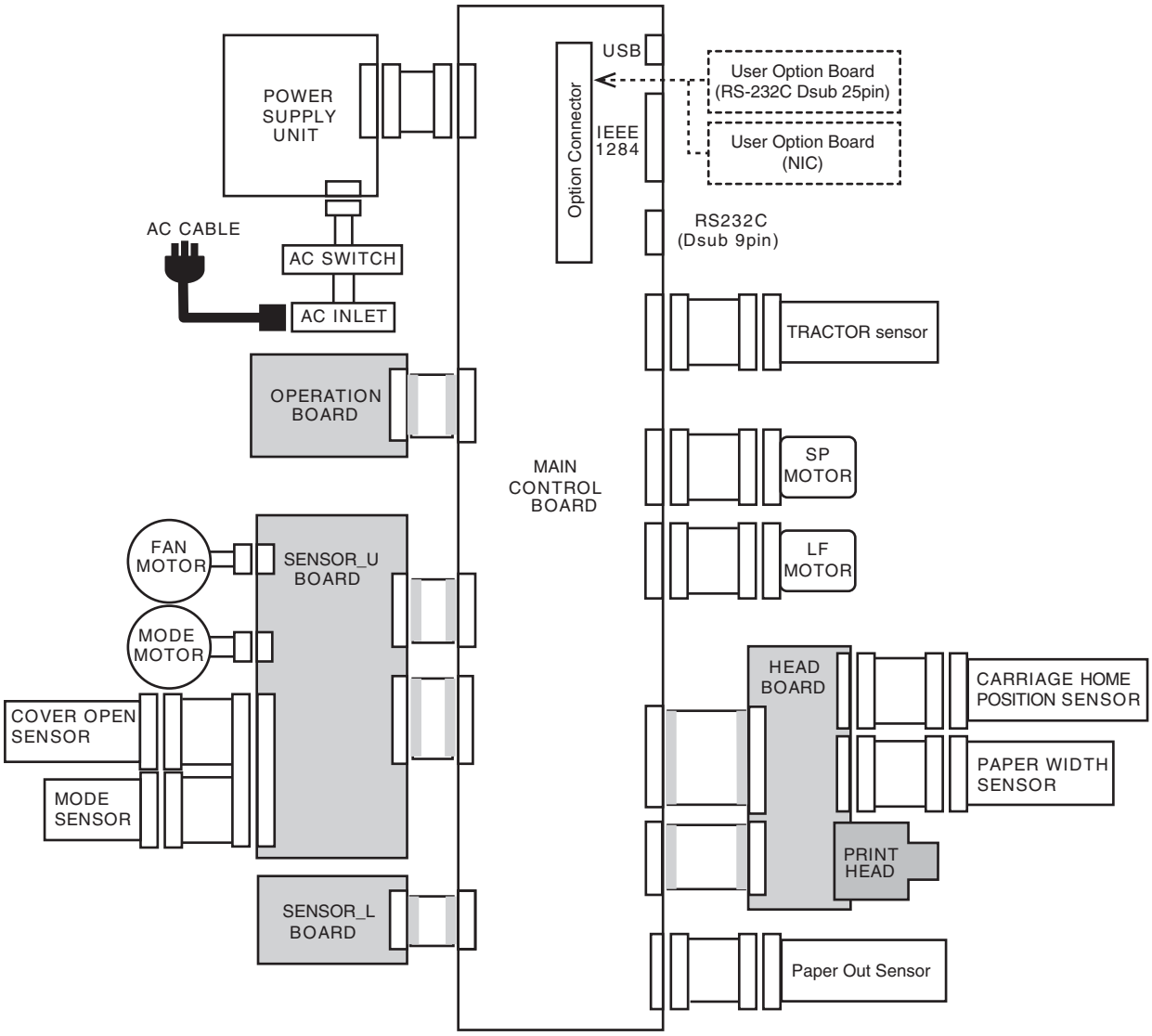
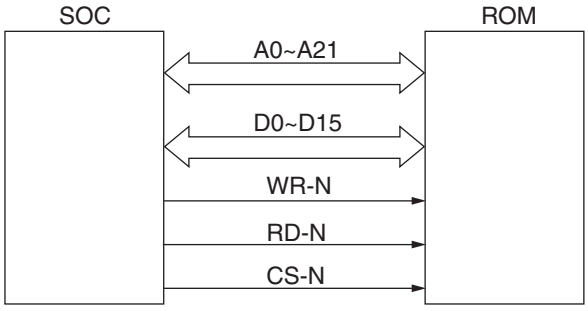

POWER SUPPLY UNIT
AC CABLE
AC SWITCH
AC INLET
OPERATION BOARD
FAN MOTOR
MODE MOTOR
COVER OPEN SENSOR
MODE SENSOR
SENSOR_U BOARD
SENSOR_L BOARD
MAIN CONTROL BOARD
Option Connector
USB
IEEE 1284
User Option Board (RS-232C Dsub 25pin)
User Option Board (NIC)
RS232C (Dsub 9pin)
TRACTOR sensor
SP MOTOR
LF MOTOR
HEAD BOARD
CARRIAGE HOME POSITION SENSOR
PAPER WIDTH SENSOR
PRINT HEAD
Paper Out Sensor

Figure 9-1

(2) Program ROM (external FLASH ROM)

The program to make the printer work is stored in FLASH ROM as external ROM.

FLASH ROM that can be installed is 64Mbit(16bit x 4096k) or less.



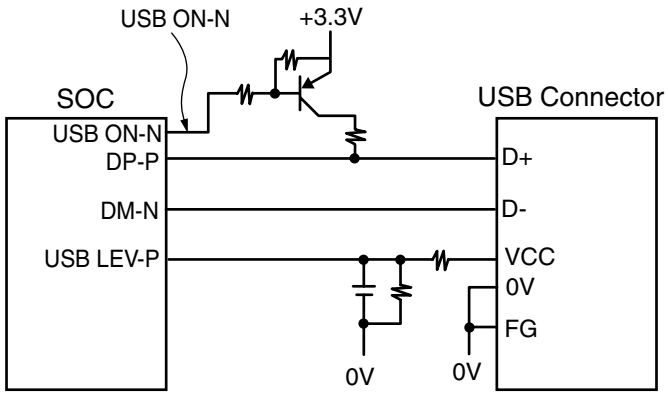
(3) RAM

In RAM, the memory capacity built into SOC is 4Mbit (16bit x 256K).

(4) USB Controller

The USB Controller detects and controls the USB interface.

The USB controller is built into SOC. The figure below shows the outline circuit.



9.2.2 Initialization

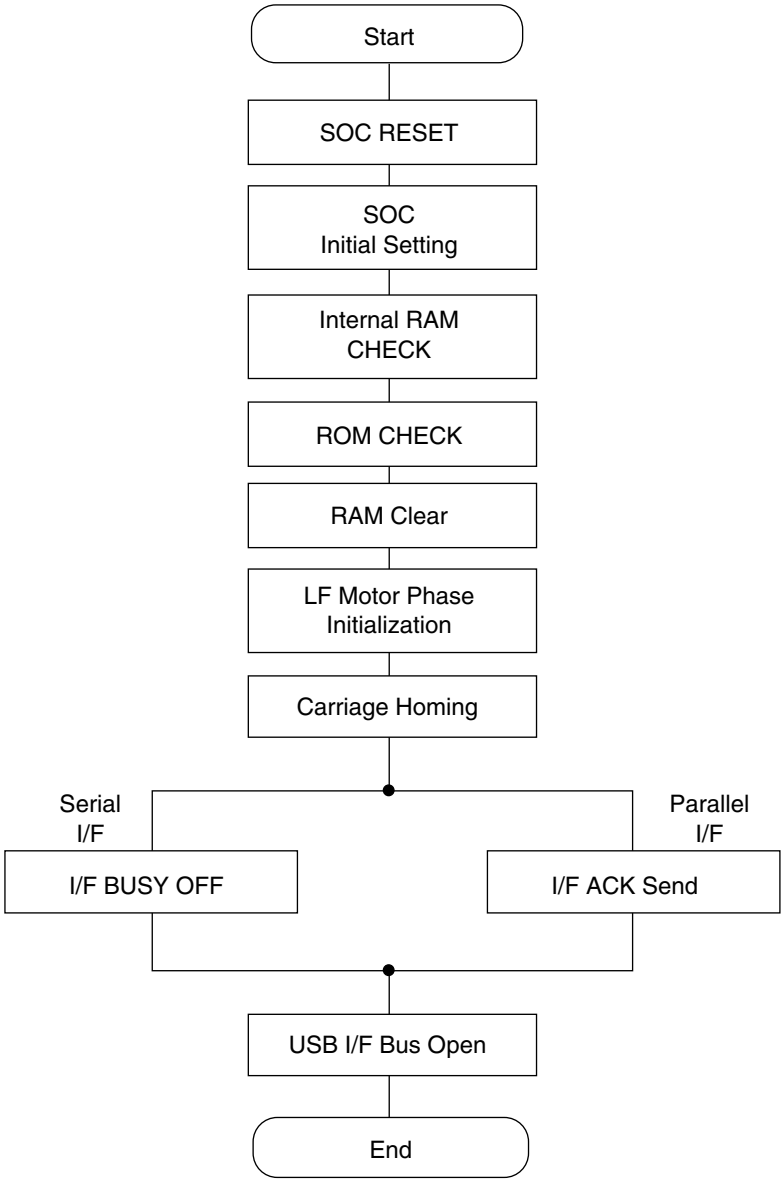
This printer is initialized when the power is turned on or when the I-PRIME-N signal is input from the host side via the parallel interface.

For the initialize operation, the RST-N signal is first output from the reset circuit to reset the SOC and Flash ROM. When resetting ends, the program starts. Reset operation by I-PRIME starts program to initialize, but does not reset the SOC.

The program here sets the mode of the SOC, checks the memories (ROMs and RAMs), then carries out carriage homing, and determines the LF motor phase.

Finally, the program establishes the interface signals (P-I/F: ACK-P signal sending, and S-I/F: BUSY-N signal off) and lights the “SEL” lamp to inform the ready state for receiving to the host side and ends the initialize operation.

After USB I/F control I/O initialization and USB I/F bus opening.



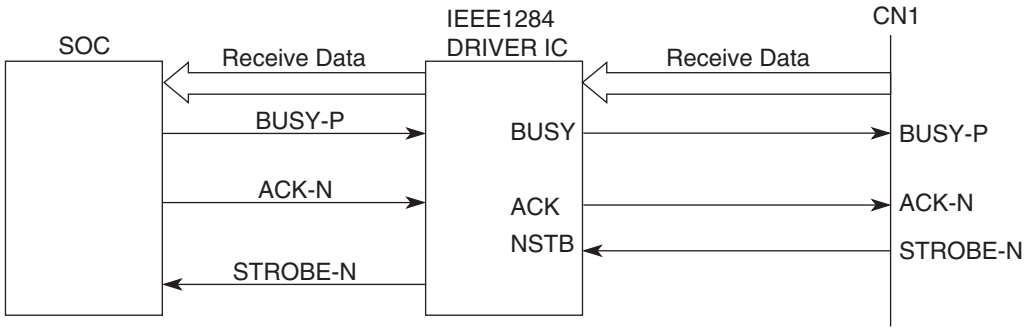
9.2.3 Interface Control

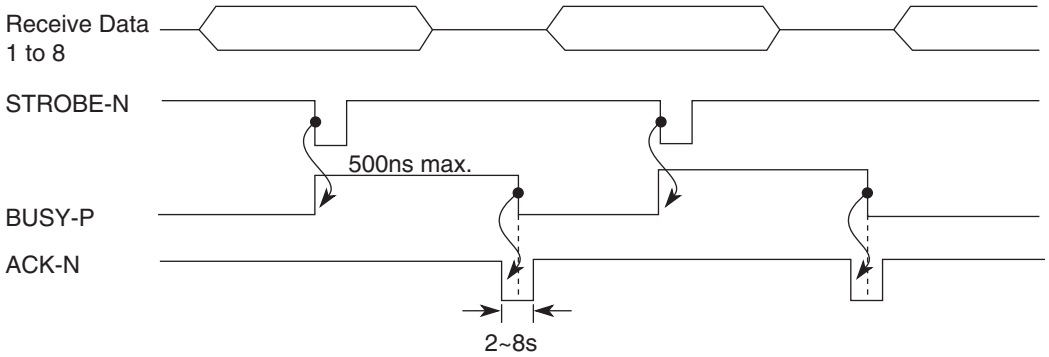
(1) Parallel Interface

The parallel data input from the host to the interfaced LSI is latched to its internal register at the falling edge of the STROBE-N signal.

At the same time, the LSI sets the BUSY-P signal to the high level to inform the host that the data is being processed.

When the data processing ends, the BUSY-P signal is set to off and the ACK-N signal in sent to request the next data. When reception is impossible because the buffer is full, the BUSY-P signal is sent to request stopping of data transmission.





* The $\overline{\text{STROBE-N}}$ based timing for the BUSY-P signal is adjustable from the Maintenance menu.

$\overline{\text{ACK-N}}$ signal timing and BUSY-P signal timing can be adjusted from the Maintenance menu.

(2) Universal Serial Bus (USB)

Universal Serial Bus Specification Revision 2.0 (Full speed) compliance.

1) Connector

- Printer Side : "B" Receptacle (Upstream Input to the USB Device)
- Cable Side : Series "B" Plug

2) Cable

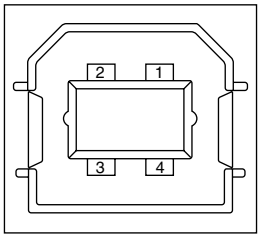
- Cable Length : Maximum 5.0m (A cable must be met USB Spec Rev 1.1 for normal operation)

Note: Cable is not supplied.

3) Table of USB I / F signals

Contact Number	Signal Name	Typical Wiring Assignment
1	Vbus	Red
2	D -	White
3	D +	Green
4	GND	Black
Shell	Shield	Drain Wire

4) Connector pin arrangement



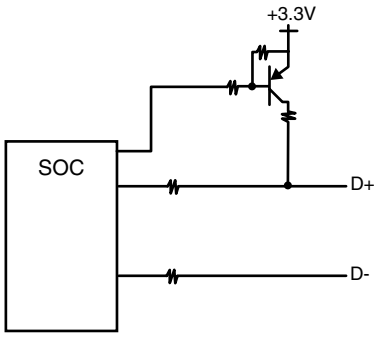
5) Mode & Class of Device

- Full - speed Driver
- Self - powered Device

6) Data Signaling Rate

- Full - speed function - 12Mb/s ± 0.25%(2500ppm)

7) Interface circuit



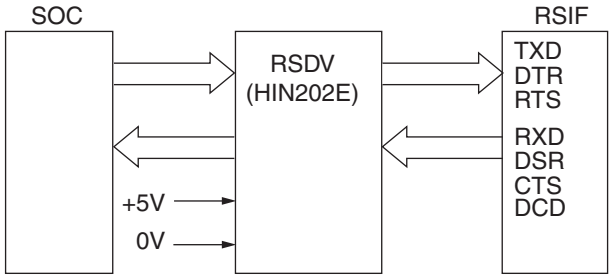
8) Signal Level

- Input / Output Level

Parameter	Symbol	Min.	Max.	Units
Input Levels :				
High (driven)	V_{IH}	2.0		V
High (floating)	V_{IHZ}	2.7	3.6	V
Low	V_{IL}		0.8	V
Output Levels :				
Low	OL	0.0	0.3	V
High (driven)	OH	2.8	3.6	V
Output Signal Crossover Voltage	V_{CRS}	1.3	2.0	V

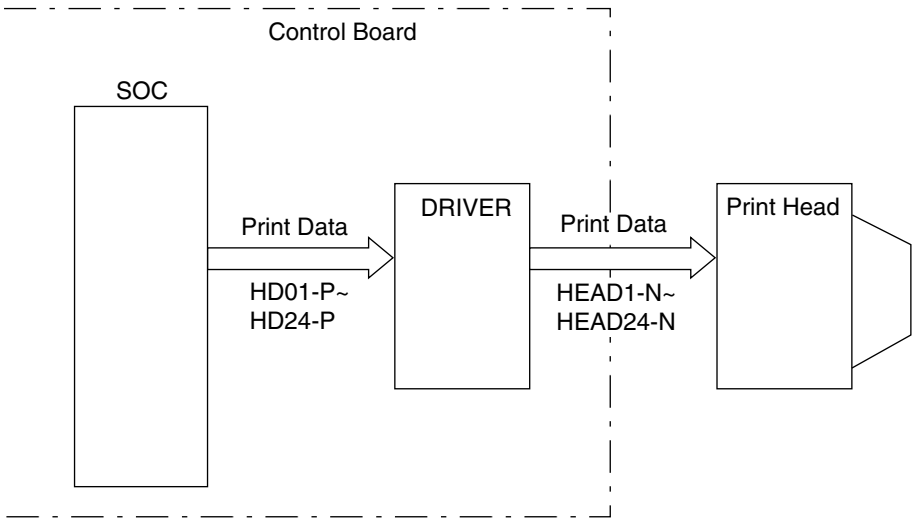
(3) RS232-C Serial Interface

This serial interface is capable of transmitting and receiving simultaneously at speeds up to 19,200 bits per second. Two protocols are available: printer Ready/Busy and X-ON/X-OFF modes.



9.2.4 Print Control

Print data is transmitted as parallel data (HD01~HD24) from SOC to print head. SOC generates print timing and drive time.

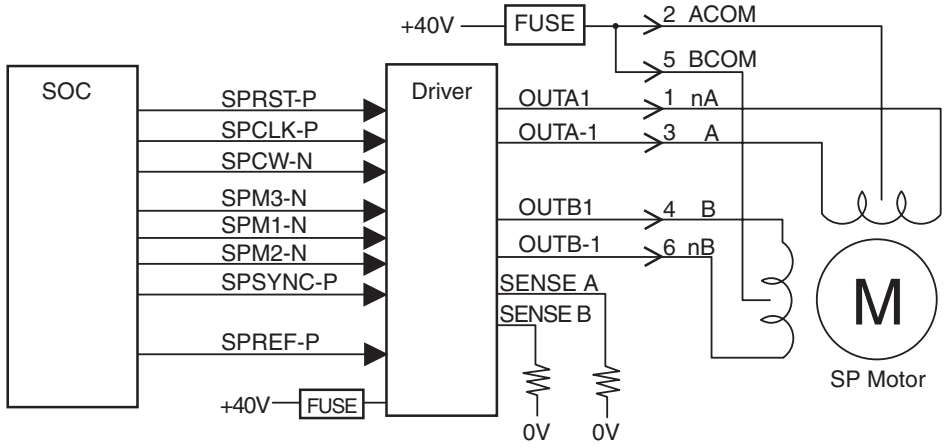


9.2.5 SP/LF/MODE/FAN MOTOR CONTROL

The driver of each motor is controlled according to the control signal from SOC and the motor is driven.

(1) SP MOTOR CONTROL

The motor that uses it is a hybrid type stepping motor.
The outline circuit composition : as shown in the following figures.



The drive system is a unipolar fixed current drive method.

Each output of OUTA1, OUTA-1, OUTB1, OUTB-1 is turned on synchronizing with the SPCLK-P signal, driving current flows to the motor, and the motor rotates.

The method of exciting the aspect by combining signals of SPM3-N~SPM1-N is set.

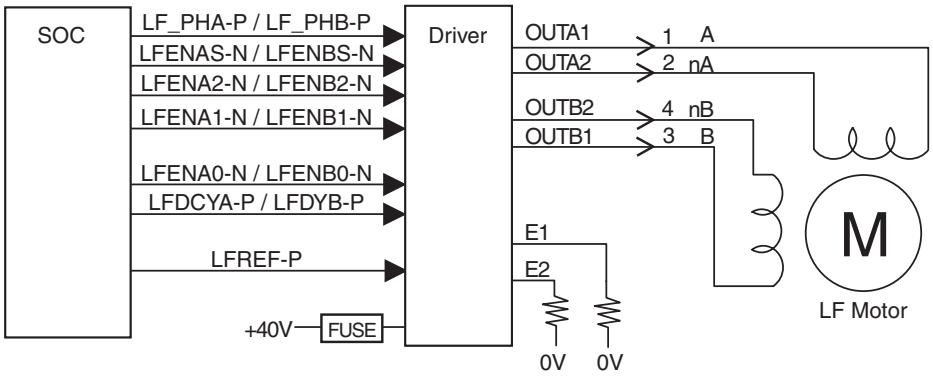
Driving current value to the motor is set according to the SPREF-P signal.

The direction where the motor is rotated is controlled by the SPCW-N signal.

(2) LF MOTOR CONTROL

The motor that uses it is hybrid type stepping motor.

The outline circuit composition : as shown in the following figures.



The drive system is a bipolar fixed current drive method.

The OUTA1, OUTA2 and OUTB1, OUTB2 signals are turned on synchronizing with the signal, the current flows to the motor each aspect, and the motor rotates.

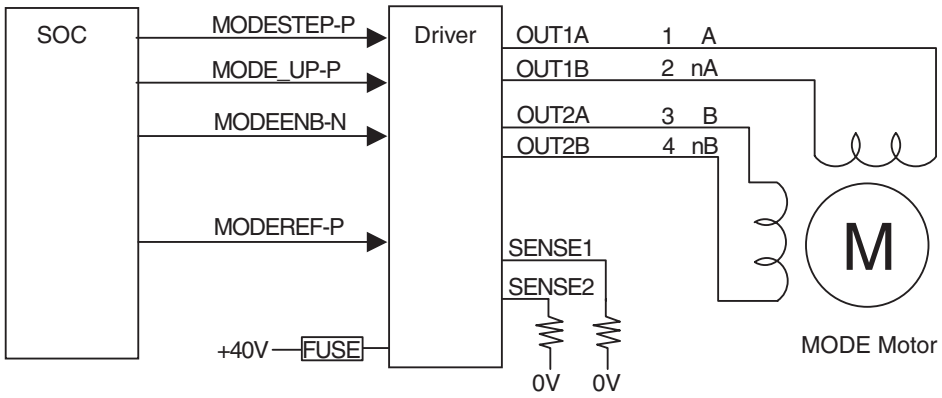
The method of exciting the aspect by combining signals of LF_PHA-P and LF_PHB-P is set.

The motor drive current value is set by the LFREF-P signal.

(3) MODE MOTOR CONTROL

The motor that uses it is PM type stepping motor.

The outline circuit composition : as shown in the following figures.



The drive system is a bipolar fixed current drive method.

The MODESTEP-P signal is clock signals, OUT1A, 1B and OUT2A and 2B signals are turned on synchronizing with the signal, the current flows to the motor each aspect, and the motor rotates.

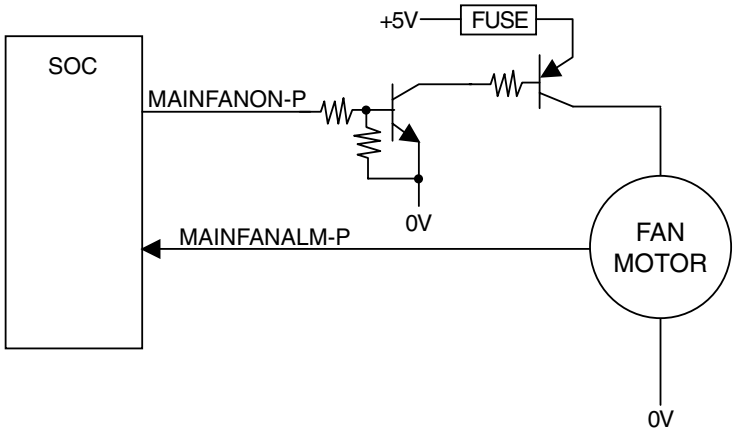
(4) FAN CONTROL

The motor that uses it is DC brushless FAN motor.

The outline circuit composition is as follows.

On/off is controlled by control signal MAINFANON-P from SOC.

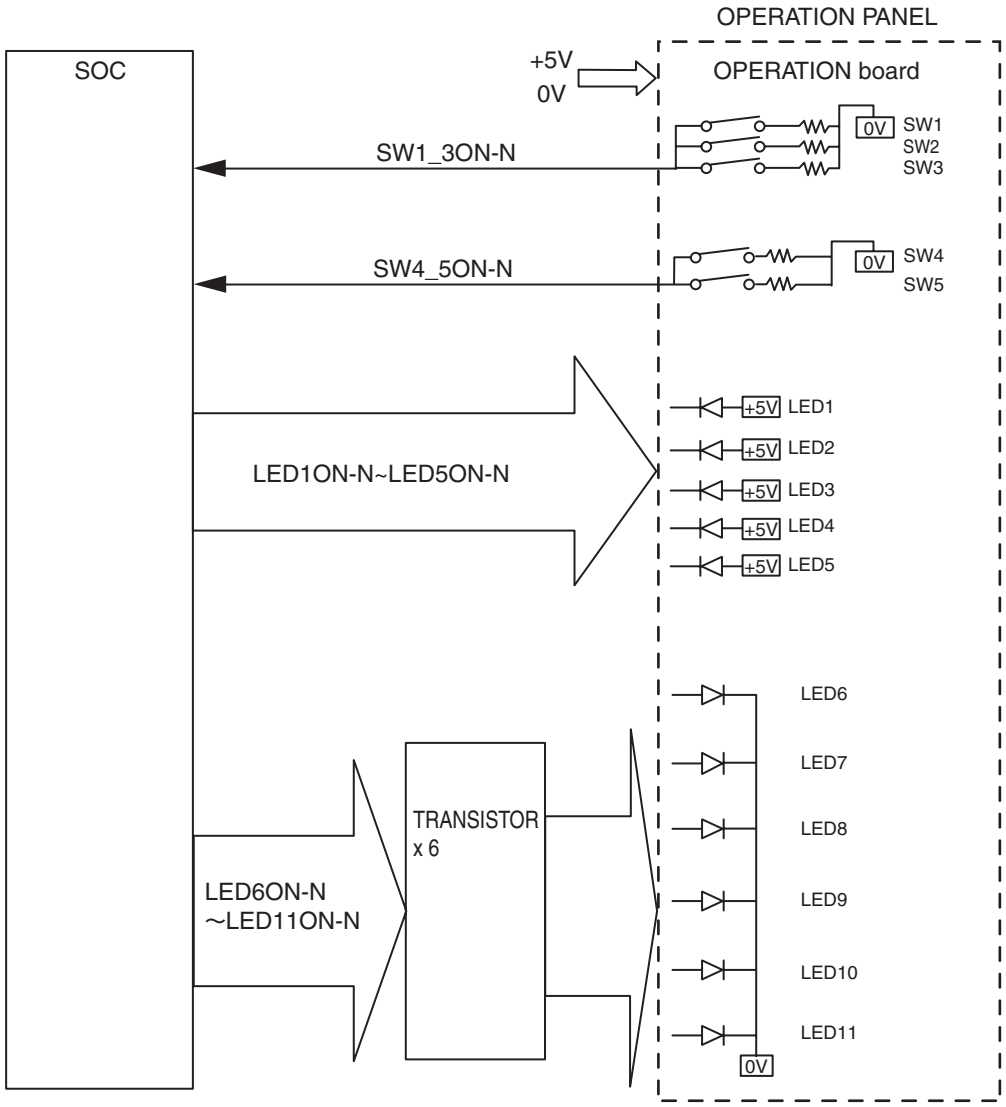
When the motor stops by some factors when the motor rotates, the MAINFANALM-P signal is sent from FAN, and this signal is recognized with SOC and it is assumed fan alarm.



9.2.6 OPERATION PANEL

OPERATION PANEL is controlled by each signal port of SOC.

An outline circuitry is as follows.



9.2.7 Alarm Circuit

(1) Head drive time alarm circuit

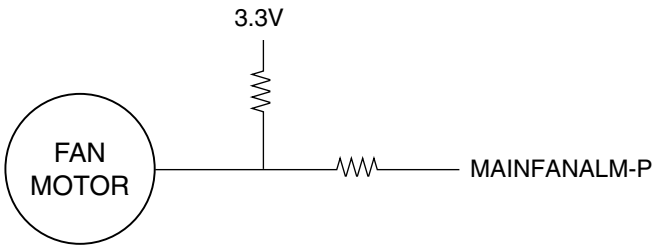
This circuit monitors the drive time using the DT1ALM1-N signal interlocked with the overdrive signal of each drive circuit.

If the drive time of any drive circuit exceeds the specified time, the drive fault alarm circuit sends an ALM-P signal to POWER SUPPLY UNIT.

This signal turns off +40V and +5V output. This state is maintained after the power switch is turned off until the power supply resumes about 30 seconds later. Until the cause of the output of the ALM-P signal is removed, even if the power supply is resumed this function operates so that no +40V and +5V output occurs.

(2) FAN alarm

The SOC detects 3.3V on the signal even through the fan is driven.



(3) Overheat alarm

(a) Head overheat alarm

The voltage of the output HTEMP signal of the thermistors, one of which is contained in the print head is monitored by the A/D port of the SOC to control the voltage.

(b) PCB overheat alarm

The voltage of the output PCBTEMP signal of the thermistors, one of which is contained in the Control Board by the A/D port of the SOC to control the voltage.

9.2.8 Power Supply Unit

This power supply unit is a switching power supply. This power supply unit supplies the +5VDC, +40VDC.

9.2.9 Motor/FAN/Aluminum electrolytic capacitors

There is a deteriorated possibility when motor/fan/aluminium electrolytic capacitor uses a long term exceeding five years of the life of equipment.

In that case, the exchange of motor/fan/power supply unit/control board might become necessary.

9.3 Mechanism and Operation

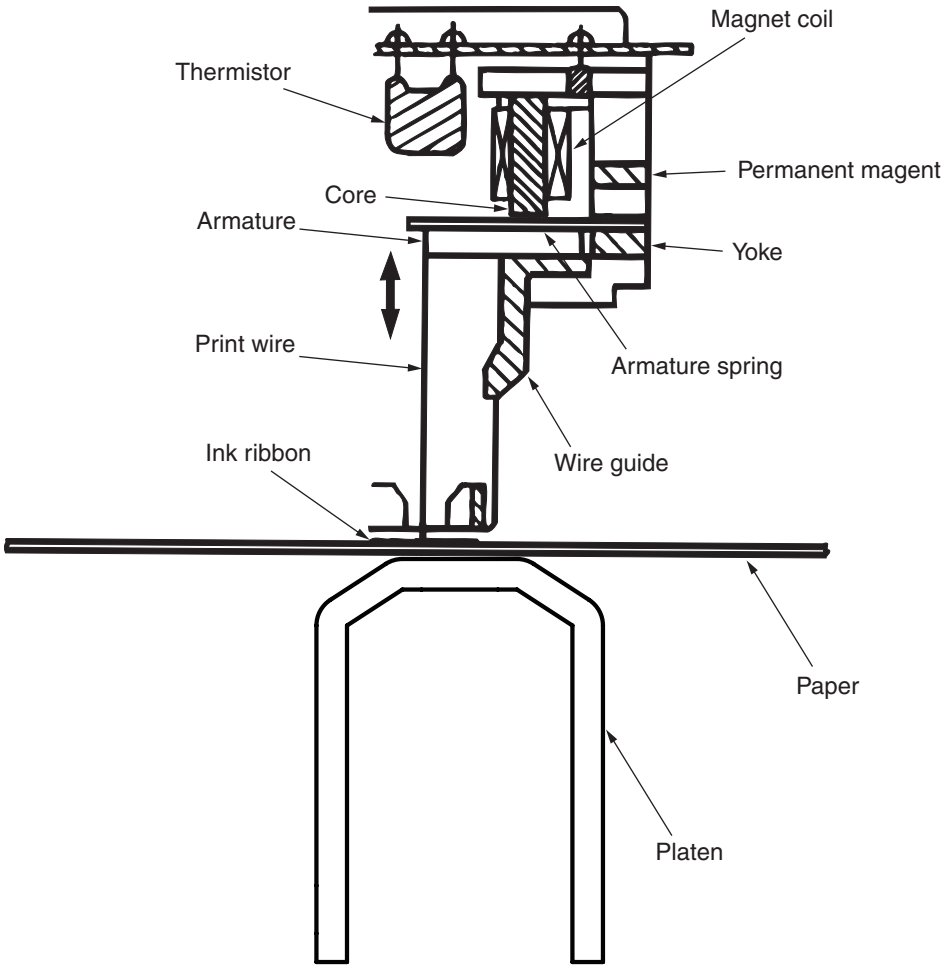
9.3.1 Mechanism and operation of the print heat

The print head is a spring charge type head using a permanent magnet and is installed on a carriage that moves in parallel with the platen.

(1) Operation of the print head

An armature is normally absorbed to the core by warping an armature spring with a permanent magnet. The status of the print wire, which is integrated with the armature, will also be reset at this time.

When the magnet coil is energized by the print command from the device control unit, a magnetic flux opposite to that of the permanent magnet is generated. Then, the armature moves in the opposite direction of the core from the force of the armature spring and the print wire collides with the platen. Paper and ink ribbon are set between the platen and print wire, and due to this collision, the ink on the ink ribbon is transferred on to the paper.

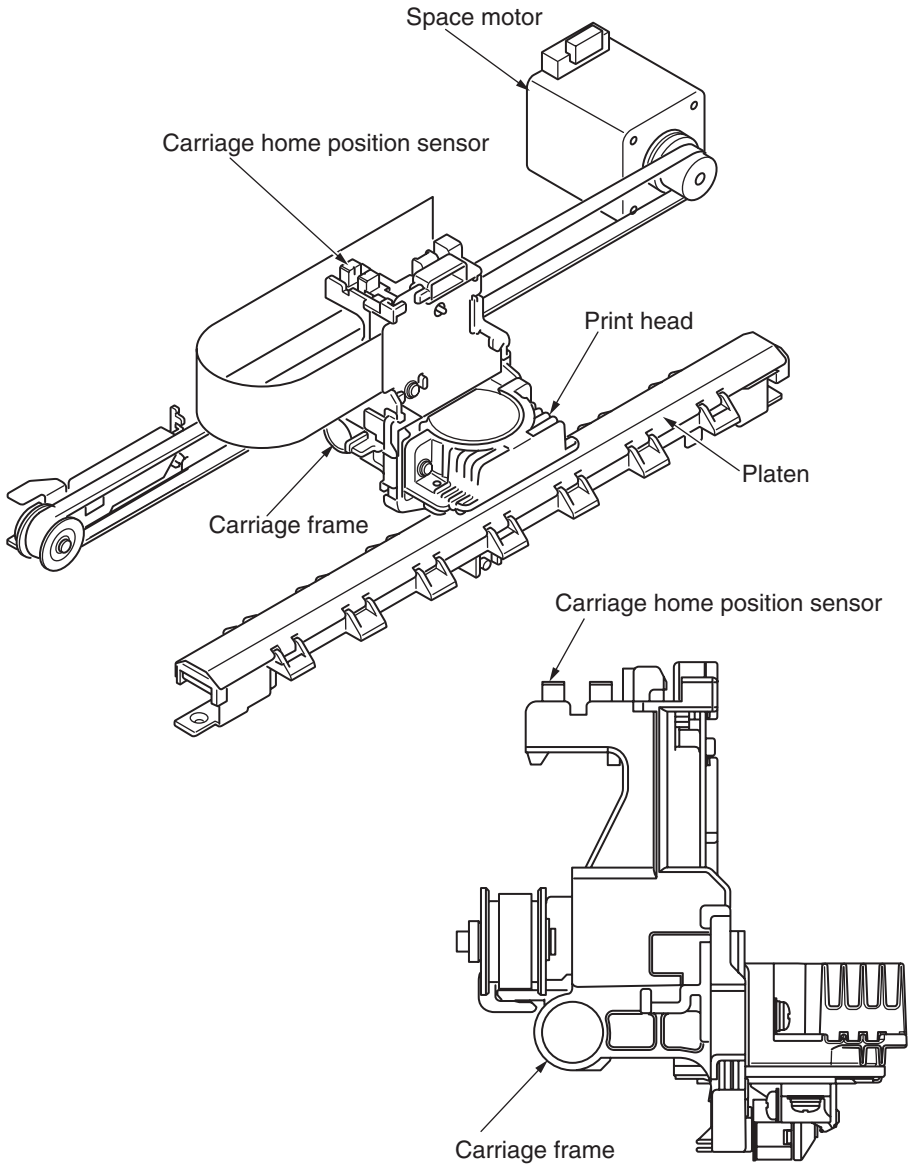


9.3.2 Mechanism and operation of space

The space mechanism of printers consists of several parts, including a carriage shaft placed parallel to a platen and a carriage frame that moves along the carriage shaft. The space mechanism is driven by a space motor located behind the carriage frame.

(1) Spacing operation

A carriage carrying a print head moves on its shaft parallel to a platen. As a space motor revolves, the power of the space motor is transferred to a mini pitch belt. This completely moves the carriage. The position of the frame of the carriage is identified by the numbers of pulses from right and left carriage position sensors.



9.3.3 Mechanism and operation of ribbon feed

Ribbon feed is a mechanism to feed the ribbon which is driven by the stepping motor.

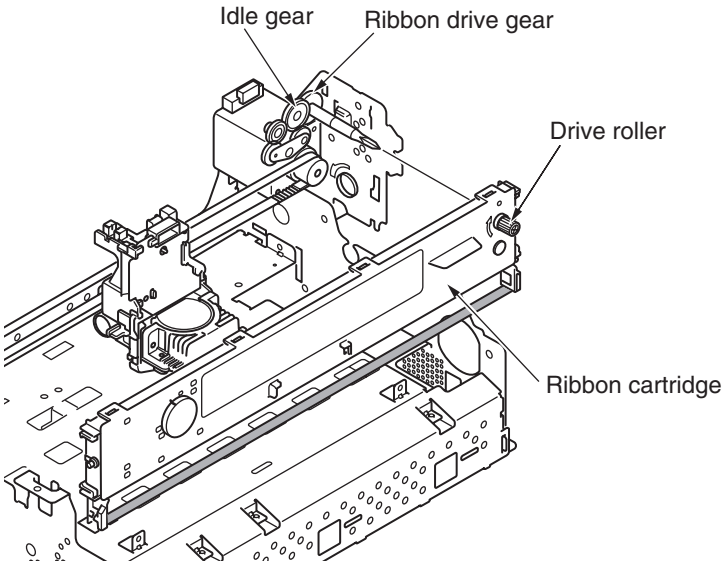
(1) Ribbon cartridge

The use of a one-way feed endless ribbon provides clear print results.

(2) Feed operation

Ribbon feed is initiated at the same time the spacing operation is initiated regardless of the mode, and stops when the spacing operation is ceased.

The rotation of a driven stepping motor is transferred to the drive roller in the ribbon cartridge via the ribbon gear which feeds the ink ribbon.



9.3.4 Mechanism and operation of paper feed

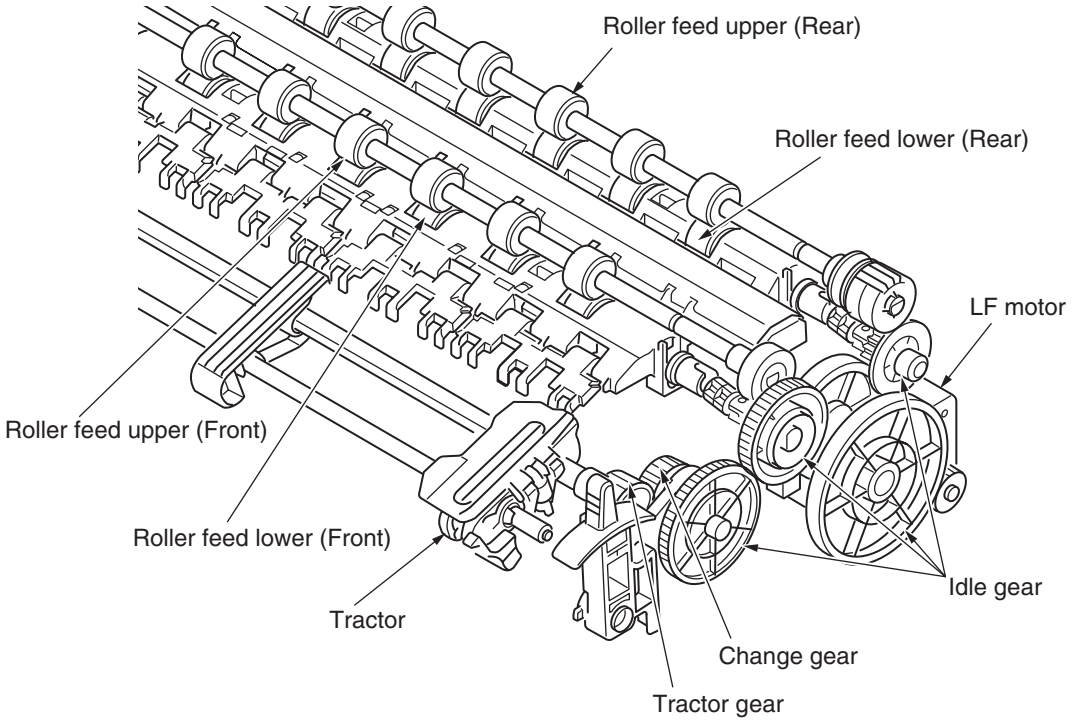
The line feed operation is driven by the LF motor that feeds the line feed roller and pin tractor.

(1) Paper feed operation

The LF motor (stepping motor) for feeding paper is installed on the left frame and the rotation of the motor is transferred to the platen gear via the deceleration gear.

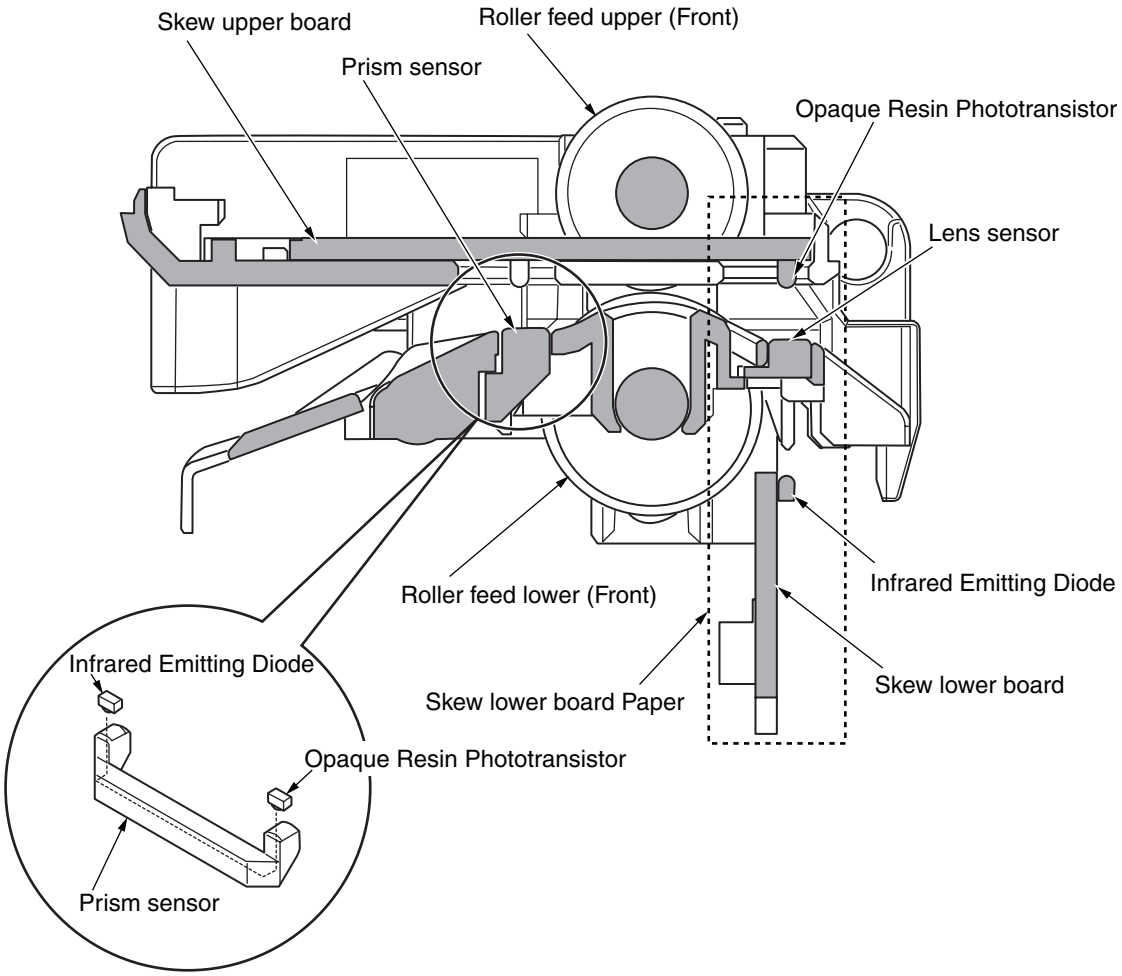
The rotation of the line feed roller is also transferred to the pin tractor by switching the change gear.

It is mechanically designed so that paper is fed by 5/9inch (14.1mm) when the LF motor rotates 200 step.



9.3.5 Mechanism for detecting the paper-end

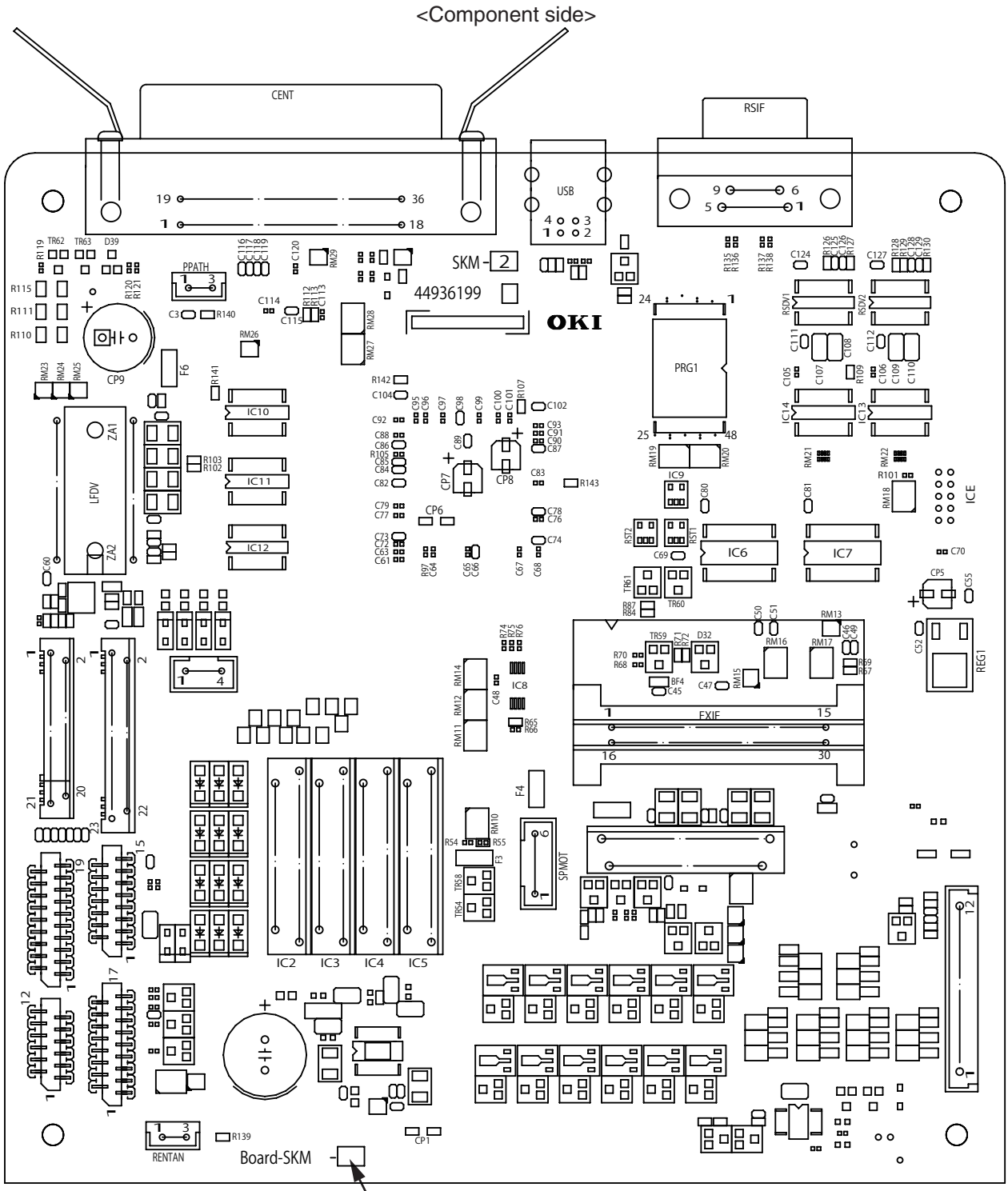
Mechanism and operation of paper-end detection mechanism (A skew sensor doubles as a paper-end sensor)
When paper is inserted, the paper blocks the light from the transmission sensor located above and under the paper, so the status of the paper-end sensor is OFF. The status changes to ON when light is transmitted due to paper-end, so that paper-end is detected. Paper-end is detected at approximately 23mm of distance from the print position.



APPENDIX A PCB LAYOUT

-PCB List-

(1) Control Board

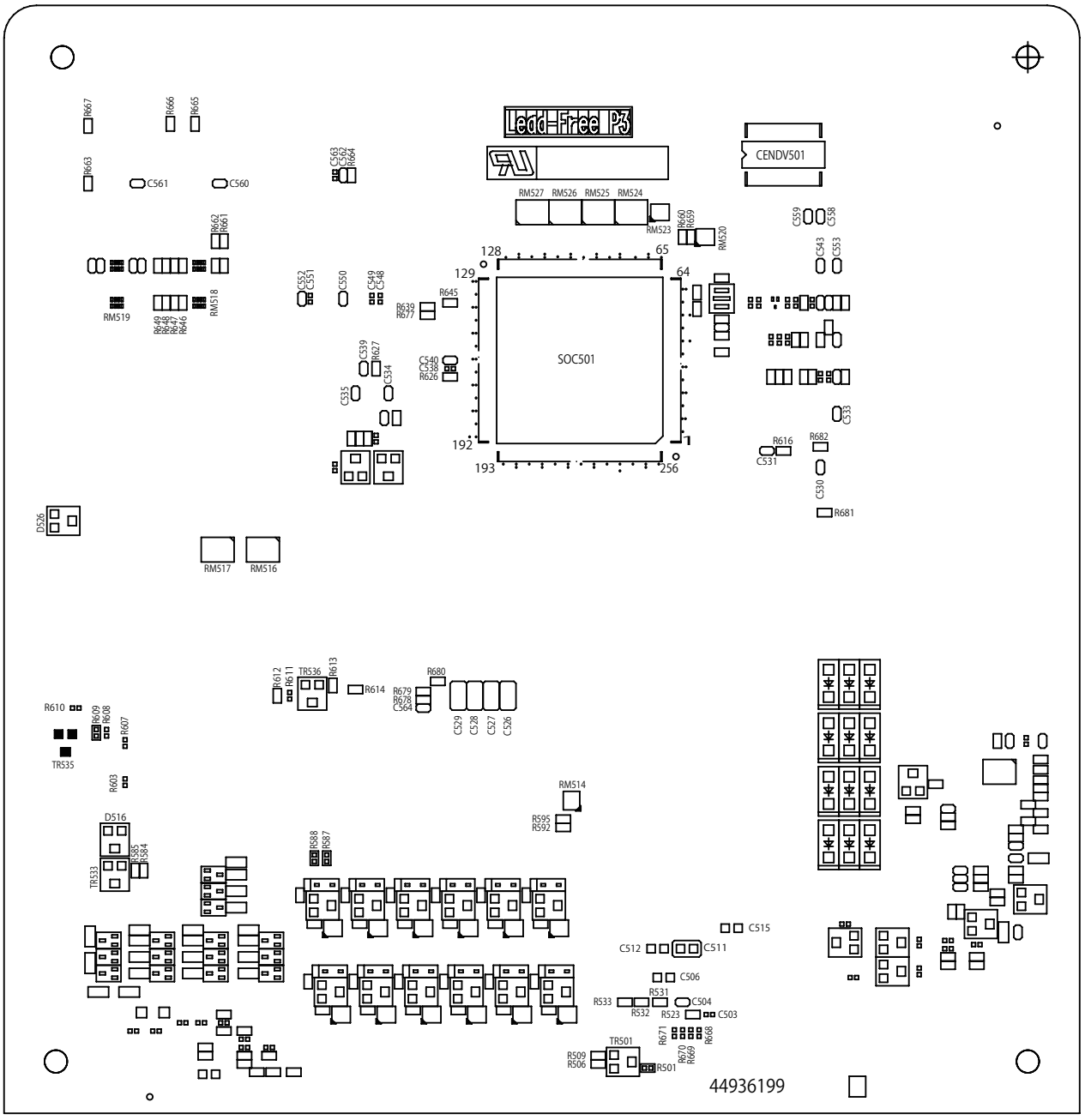


Note!:This stamp is only printed for the replace board .

(The board in the shipping unit is not printed it.)

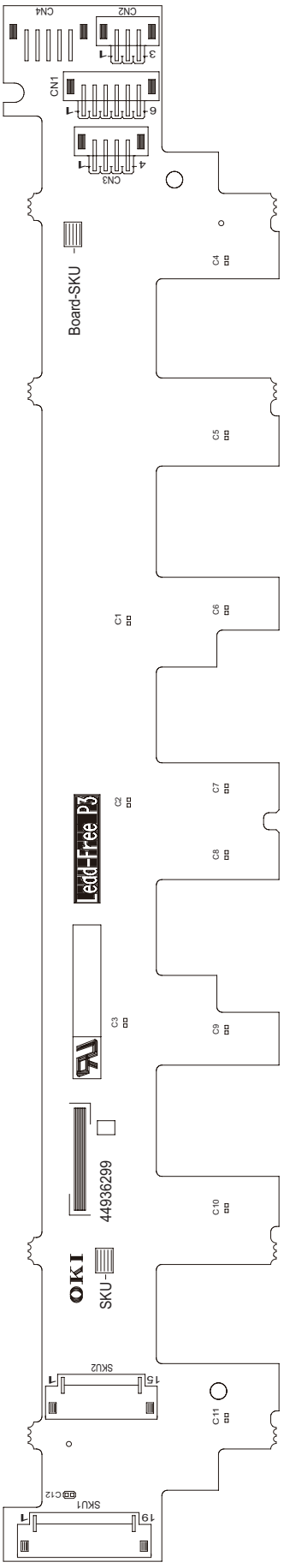
Stamp	Destination
6	OEL
7	AOS

<Solder side>

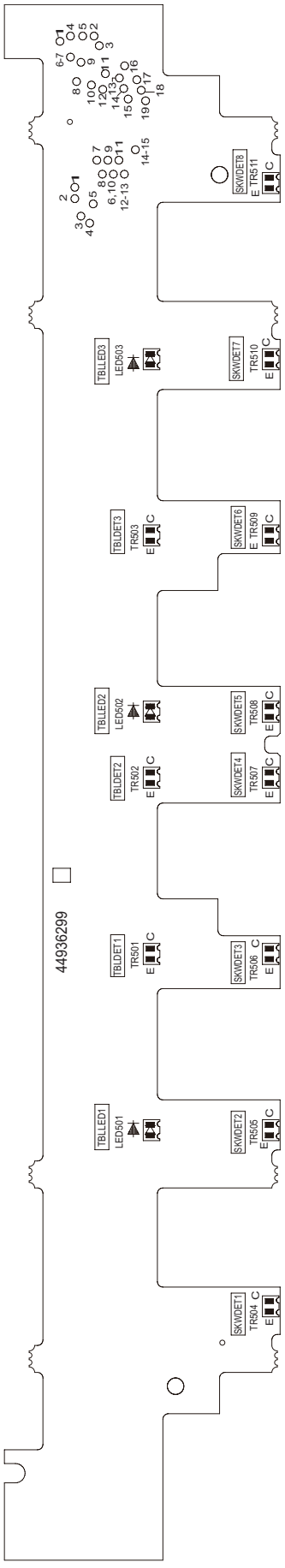

Lead-Free P3
CENDV501
SOC501
128
65
129
64
192
1
193
256
44936199

(2) Skew Upper Board

<Component side>

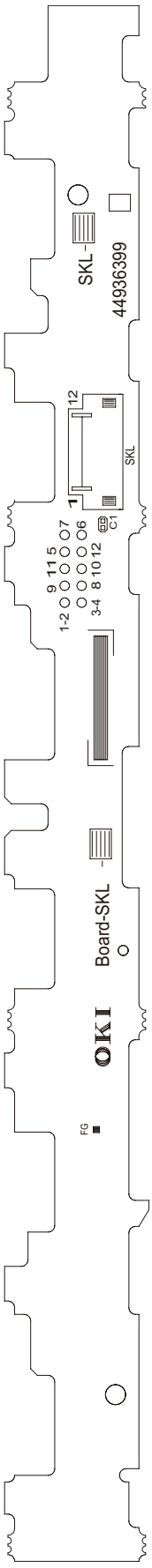


<Solder side>

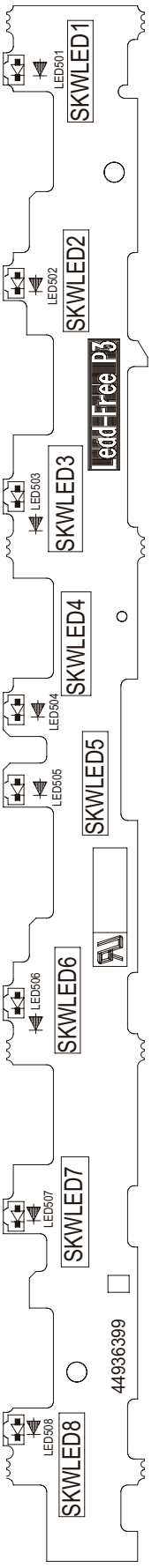


(3) Skew Lower Board

<Component side>



<Solder side>



(4) Operation Board

<Solder side>